Cover Page

Universiteit Leiden

Author: Koelewijn, Hennie
Title: Quality of work and well-being of health care employees : towards a problem solving intervention approach
Issue Date: 2013-05-15

Quality of Work and Well-being of Health Care Employees:

Towards a problem solving intervention approach

PROEFSCHRIFT

ter verkrijging van
de graad van Doctor aan de Universiteit Leiden,
op gezag van Rector Magnificus prof. mr. C.J.J.M. Stolker
volgens besluit van het college voor Promoties
te verdedigen op woensdag 15 mei 2013
klokke 16.15 uur.

door

Hennie Koelewijn
geboren te Bunschoten in 1955

Promotiecommissie

Promotor:	Prof. dr. C.M.J.G. Maes, Universiteit Leiden
Co-promotor:	Dr. M.P. van der Doef, Universiteit Leiden
Overige leden:	Prof. dr. N. Ellemers, Universiteit Leiden
	Prof. dr. F. Kittel, Université Libre de Bruxelles
	Dr. P.M. Le Blanc, Technische Universiteit Eindhoven
	Prof. dr. E.L.H.M. van de Loo, Vrije Universiteit Amsterdam
	Dr. C.J.M. Verhoeven, Universiteit Leiden

Voor Willy, Pa en Teunie

Amor vincit omnia

Colofon

ISBN 9789090274690

DANKWOORD

Graag wil ik op deze plaats mijn dank uitspreken aan ieder die op zijn of haar wijze heeft bijgedragen aan het tot stand komen van dit proefschrift.

Allereerst wil ik mijn promotor Prof. dr. Stan Maes hartelijk danken voor zijn niet aflatende steun en de mogelijkheden die hij mij als gastonderzoeker heeft gegeven aan de sectie klinische – en gezondheidspsychologie van de Universiteit Leiden. Het is een voorrecht om zo lang met hem samen te werken en bovenal van hem te leren. Mijn copromotor dr. Margot van der Doef wil ik danken voor de heldere en duidelijke feedback, haar bijdrage en steun zijn van grote waarde voor mij geweest. Ook dr. Chris Verhoeven ben ik dankbaar, omdat ze altijd een luisterend oor had toen ze me wegwijs maakte in de onderzoekswereld.

Mijn grootste dank gaat uit naar de medewerkers van Het Westerhonk in Monster en SizaDorp groep in Arnhem die gemotiveerd waren, naast hun zware werkzaamheden in de gehandicaptenzorg, lange vragenlijsten in te vullen. De onderzoeken die in dit proefschrift staan beschreven waren niet mogelijk geweest zonder de inspanning van de directie. Met name Anton Renting, Bert Rijks en Tom Zewald wil ik bedanken voor hun enthousiasme en inspanning om de ZZZ doelen te bereiken. Verder ben ik dankbaar voor de inzet van de directie en medewerkers van de controle instellingen. Ten slotte wil ik Edwin van Schijndel van de VGN bedanken voor de samenwerking en financiële support, waardoor het thema kwaliteit van arbeid binnen de gehandicaptenzorg niet meer is weg te denken.

Mijn collega's van PCC ben ik dankbaar voor de interesse en support die ik kreeg, ze hebben mij zeker gemotiveerd vooral door te gaan. Mijn dank gaat vooral uit naar Vera van Mourik die als trainee bij PCC kwam werken en werd gefascineerd door het ZZZ project. Je motivatie om me zo goed mogelijk te assisteren zal me altijd bijblijven. Bovenal wil ik Gulsen Malenstein bedanken, die mij de laatste 3 jaar voortdurend heeft aangemoedigd, toegesproken en het letterlijk mogelijk voor me gemaakt heeft het proefschrift af te ronden. Sinds 2012 heb je, als directeur de financiële en organisatorische taken binnen PCC van mij overgenomen en ben ik je dankbaar voor je oprechte directheid. Nynke Kuipers ben ik dankbaar voor ruim 13 jaar samenwerken binnen PCC en bovenal voor je vriendelijkheid. Van Den Haag verhuisde je mee naar Bilthoven en Amersfoort, we gingen naar EHPS conferenties van Lissabon tot Praag en nu ben je manager training en opleiding binnen PCC.

Ik wil mijn familie en vrienden bedanken voor de belangstelling, de steun en de nodige pragmatische opmerkingen. Vaak vroegen jullie wanneer mijn studie nu eens klaar was, het is zover!

Lieve Ma, je was en blijft, samen met Pa, mijn grote inspiratiebron. Altijd blijf je me aanmoedigen te leren en motiveren door te gaan, ondanks de verliezen die we moesten incasseren. Oprecht hoop ik zo oud te mogen worden, zoals jij dat doet is mooi om mee te mogen maken.

Tenslotte wil ik Margreet, Thijs, Bart, Erica en Gulsen bedanken voor hun vertrouwen en geduld. Ik hoop dat ik jullie, in je ontwikkeling tot de prachtige volwassen mensen, niet te veel heb verwaarloosd. Gezien het feit, dat jullie ons Hunter, Sennah, Kailah en Julius hebben gegeven (met nog twee op komst), mag ik hopen dat jullie onafhankelijke natuur daar niet onder heeft geleden.

Lieve Wim, een extra woord van dank is voor jou. Doorzetten is volgens jou mijn krachtigste eigenschap, maar zonder jouw liefde, pragmatisme en toewijding zouden de afgelopen 10 jaar veel minder plezierig zijn geweest. Steeds was het bijna klaar en alsmaar moest er nog iets aan worden verbeterd. Wat zullen we genieten in Italy de komende jaren, samen …… en met onze aanhang!

CONTENTS

CHAPTER 1

General introduction and outline

1.1 General introduction

In health care settings, the time when quality of care for a patient is achieved at the expense of the health of employees, seems to be over. High absence and turnover levels in the health care sector show that more attention to care employees is of great importance for their well-being and health. To illustrate, in the Netherlands the percentage of absenteeism in health care settings in the last decade has consistently been above the national average. Between 1998 and 2010 absenteeism rates in health care are 1 to 3% higher compared to the national mean (CBS Statline, 2011). In view of these facts it is no surprise that health care employees also experience reduced quality of work and well-being.

In the literature, often cited determinants of employee health and well-being are job demands, control and social support (JDC(S)-model; Karasek, 1979; Johnson, Hall & Theorell, 1989; Karasek & Theorell, 1990). The work conditions of the JDC(S) model are frequently studied in health care employees (Häusser, Mojzisch, Niesel & Schulz-Hardt, 2010), who are often confronted with high levels of job demands (Bakker et al., 2007). Overall, these work conditions are found to be predictive of well-being of health care employees (De Jonge, Mulder & Nijhuis, 1999). Other quality of work factors, such as organizational risk factors (Akerboom & Maes, 2006) and role ambiguity (Pomaki, Supeli & Verhoeven, 2007), have also been associated with well-being of health care employees.

The most cited well-being outcomes studied in health care settings are burnout, job (dis)satisfaction, somatic complaints and psychological distress (Bakker, Demerouti, De Boer & Schaufeli, 2003; Häusser et al., 2010; Van der Doef & Maes, 1999a). Health care employees specifically experience lower job satisfaction, and lower levels of well-being compared to other occupational groups (Pousette & Hanse, 2002).

The improvement of quality of work and well-being of care employees implies more than just an active policy on sickness absence. Since 1994 employers in health care institutions are responsible for guidance of the employees that become ill, according to the Sickness Absence (Reduction) Act. This law necessitates managers to have an active attitude in creating a healthy workplace. An active attitude can be created by means of a worksite intervention in which both managers and health care employees are involved. By implementing worksite interventions, managers need instruments and methods to enhance the quality of work and eventually employees well-being, e.g. procedures with information for care employees to improve the communication and in this way to increase support from supervisors (Akerboom & Maes, 2006; Johnson & Hall, 1988; Johnson et al., 1989; Karasek & Theorell, 1990). This implies that managers have to increase their knowledge of the organizational context by involving employees (Israel et al., 1996). This dual approach, a combination of a top down

approach (involvement by management) and a bottom up perspective (involvement of employees), might be most effective in worksite interventions (Arneson & Ekberg, 2005). Moreover, as Lavoie-Tremblay (2004, p. 470) argued with respect to participatory interventions: *"Rather than imposing solutions, it recognizes that people have the capacity to develop and implement their own solutions"*.

If one wants to develop a new worksite wellness/health intervention, it is important to realize what the state of the art is in this domain. The first worksite intervention programs were focusing on improving safety and physical health of employees. However, progressively more attention was given to quality of work and well-being of employees (Maes & Van der Doef, 2004). Even though consistent associations have been reported between quality of work aspects such as job demands, control and social support, and employee health/wellness outcomes (Van der Doef & Maes, 1998, 1999a; Häusser et al., 2010), there seems to be no unequivocal answer to what works nor, how and why in intervention programs (Michie & Williams, 2003). Particularly in health care centers for disabled people, job demands for both care employees and their managers are high and educational levels are often lower (Bolhuis, Mandos & Hollander, 2004). However, as stated before, for intervention programs that are targeted at improving quality of work and well-being of health care employees, a more clear implementation approach as well as a comprehensive theoretical framework for explaining changes in quality of work and well-being outcomes in employees is needed (LeBlanc et al., 2007).

A theory that can contribute to the shaping of the process of worksite intervention programs might be problem solving. Problem solving theory (e.g.: Locke & Latham, 2002; D'Zurilla & Goldfried, 1971; Austin & Vancouver, 1996; Bandura, 1989; Gollwitzer & Bargh, 1996; Gollwitzer & Moskowitz, 1996; Pervin, 1989; Wegner & Pennebaker, 1993) is focusing on the goal directed and regulative aspects of human behavior. A problem solving approach includes behavioral aspects such as monitoring, feedback and control processes (D'Zurilla & Goldfried, 1971). Moreover, problem solving theory presumes that behavior is dynamic, goal-directed and would require an active and participatory position from employees as well as managers in worksite intervention programs. Goal setting and goal facilitation at work are important aspects of a problem solving approach. Within worksite health promotion intervention programs, a distinction can be made between, 1) organizational goals, which are often directed at reducing turnover levels, and improving productivity and quality of patient care, and 2) personal goals of employees, which are directed at e.g. being healthy, feeling confident at work and maintaining social relationships. Alignment of personal and organizational goals is an important process in a problem solving intervention program to overcome or to prevent a conflict between organizational and personal goals. Therefore, it is important that intervention programs are not only implemented

through top-down processes (where only the management decides what needs to change and how to change it). Bottom up processes, where employees participate in decision making, should also be used in order to attain both organizational goals as well as personal goals of employees (Arneson & Ekberg, 2005).

A problem solving approach is occurring in four phases: 1) goal setting and shaping the plan of action, 2) feedback and process evaluation, 3) control procedures, and 4) reformulating (realistic) goals (D'Zurilla & Goldfried, 1971). In this systematic, problem solving approach, problematic components within the organization are selected and an action plan is made in a participatory manner. By means of qualitative and quantitative evaluations insight can be gained on the effectiveness of the intervention components on quality of work and well-being of employees.

Previous studies show that interventions applying a problem solving or participatory approach, affect quality of work and well-being of employees (e.g. Lavoie-Tremblay et al., 2005; Lokk & Arnetz, 2000; Mikkelsen, Saksvik & Landisberg, 2000). However, due to sparse data and mixed results no consistent conclusion can be drawn about the influence of a problem solving approach on quality of work and well-being of employees. There are several complicating factors in reaching unequivocal conclusions about how intervention programs may influence quality of work and well-being of health care employees. For example, frequently no comprehensive theoretically based approach is used, often there is a lack of an adequate research design and in a large amount of studies small research samples are used (Michie & Williams, 2003).

The foregoing introduction illustrates the persistence of problems in quality of work and well-being of employees in health care. The effectiveness of intervention programs to this respect is not yet systematically reviewed, and more insight is needed into the mechanisms responsible for improving quality of work aspects and wellness in health care settings. Problem solving might be an effective approach to steer the implementation process of worksite health promotion programs in health care settings.

For the purpose of examining the usefulness of a problem solving perspective on quality of work and well-being, an intervention study was conducted in health care centers for mentally disabled people. The study included six health care centers that had indicated, that a relatively large number of their care employees and managers were frequently absent from work for a long time, whereas the exact cause of that absence was unclear. Therefore, the policymakers of the participating health care centers wanted to gain insight into the determinants of absence, well-being and quality of work of the health care employees in their organizations. Then on the basis of this knowledge interventions to improve quality of work and well-being of the employees will be performed. Hence, the goal of the participating health care centers was: developing an active, wellness and health promoting work policy, which must

have a positive influence on the quality of work of the employees and eventually on their well-being. In 1998 a grant was obtained from the National sickness fund to carry out an intervention project with these health care centers. Three health care centers served as the intervention group and three as the control group. The goal of the researchers was to determine the effects of a problem solving implementation approach. The intervention program was based on the outcomes of a screening project, and was directed at improving the quality of work and well-being of employees. The research project was carried out in cooperation between PCC Health Promotion and the department of Health Psychology of Leiden University. The intervention project was called 'Work Without Worries'.

1.2 Outline of the thesis

In *Chapter 2* research findings are explored through a review, a) on the effectiveness of worksite health promotion interventions on quality of work and well-being of health care employees, and b) on the characteristics of worksite health promotion programs in health care settings. From the results of this review conclusions are drawn and relevant empirical findings are discussed about the effectiveness of worksite health promotion programs in enhancing quality of work and well-being among health care employees. Directions for future research are presented as well.

The purpose of *Chapter 3* is to describe the state of the art with respect to the theoretical background in worksite health promotion intervention programs targeted at quality of work and well-being of employees. Firstly, quality of work factors derived from the JDCS model and organizational risk factors from the Tripod model and their relation to employee wellness is explored. Secondly, the problem solving perspective is introduced as an intervention approach to optimize the implementation process of worksite health promotion intervention programs. Finally, practical implications for the implementation of worksite health promotion intervention programs are formulated.

In *Chapter 4*, results are presented of a cross-sectional survey that was conducted among 1673 health care employees of three experimental and three control health care centers. The objectives were to: 1) describe differences between the three experimental health care centers on quality of work (psychosocial job characteristics and organizational risk factors), higher order goal facilitation and well-being of the health care employees, 2) identify problematic factors in the experimental health care centers and present these aspects as targets of worksite health promotion intervention programs in the three experimental health care centers, and 3) present the intervention plans that were formulated in cooperation with the experimental health care centers.

The purpose of the intervention study, described in *Chapter 5*, is to evaluate the effectiveness of a problem solving intervention program on quality of work and

well-being of health care employees, in three experimental health care centers in comparison to three control health care centers. In the control centers no advice was given following the baseline measurements and no intervention plans were advised or implemented.

The following two research questions were formulated: 1) do work conditions and organizational risk factors improve after the implementation of a problem solving intervention program, compared to a control group? and 2) do higher order goal facilitation, job satisfaction and well-being aspects of health care employees improve after the implementation of the intervention?

For this purpose 707 health care employees completed questionnaires at baseline (T1) and three years later (T2). Quality of work factors covering work conditions and organizational risk factors were assessed. Well-being factors relevant for health care employees, e.g. higher order goal facilitation, job satisfaction, emotional exhaustion, depersonalization and personal competence, were included. Quality of work and well-being of the experimental group and the control group were compared at T2 using multivariate and univariate covariance analyses, with kind of shift, years in sector, education and baseline scores as control variables. Results concerning the effectiveness of the intervention program for quality of work and well-being are reported.

In *Chapter 6,* results from a 3-year longitudinal study in health care employees are presented, that investigated whether (changes in) work conditions and higher order goal facilitation are predictive of well-being outcomes of health care employees. In this chapter, work conditions, higher order goal facilitation and the changes in work conditions and higher order goal facilitation at T2 are related to job satisfaction, psychological distress, somatic complaints, emotional exhaustion, depersonalization and personal competence at T2. 707 health care employees completed questionnaires at baseline and at a three-year follow up (T2). Well-being outcomes at T2 were regressed on baseline scores regarding well-being, higher order goal facilitation and work conditions, and changes in work conditions and higher order goal facilitation between T1 and T2. Conclusions are presented regarding the relationships between work conditions, higher order goal facilitation and well-being of health care employees, and implications for further research are proposed.

The results of the foregoing chapters are discussed in *Chapter 7* in view of the different theoretical perspectives and especially from the problem solving perspective. Methodological limitations of the studies are addressed, followed by suggestions for future research on problem solving based interventions for worksite health promotion of health care employees.

CHAPTER 2

Wellness effects of worksite health promotion programs in health care settings, a review

The objective of this review is to gain insight in to the development of worksite health promotion intervention programs and their effectiveness in improving quality of work and well-being of health care professionals. Worksite health promotion was defined by the World Health Organization (WHO; Engbers, 2007, p.10) as: "*The combination of educational and environmental supports for actions and conditions of living beneficial for health" (based on Green et al., 1998)*. The WHO emphasizes that different strategies or approaches can be applied in worksite health promotion programs, these different approaches are: informational, behavioral, social and environmental policy (Kahn et al., 2002).

The population of health care professionals deserves specific attention when improving quality of work and well-being of employees, because this group presents high absence rates and turnover levels compared to other occupational groups (source: CBS Statline, 2011; Michie & Williams, 2003). Health care employees experience less job satisfaction, more psychological and somatic complaints and increased levels of burnout (Gelsema, Van der Doef, Maes & Akerboom, 2006). Furthermore, due to aging of the Dutch population the demand for health care employees increases, while the number of health care employees decreases (Ministry of VWS in The Netherlands, 2009). Therefore it is expected that a shortage of health care personnel will occur, which can cause an increase in workload, reduced quality of work and eventually decreased well-being of employees. To prevent quality of work and well-being problems in employees, next to job demands, job control and social support also need to be optimized according to Karasek and his colleagues (Karasek & Theorell, 1990). In the past decades, many studies have been done on work conditions and organizational aspects in relation to well-being of health care employees. Michie & Williams (2003) reviewed worksite health promotion programs in health care employees. They concluded that most worksite health promotion programs do not have an adequate study design, do not have sufficient sample size and do not use valid outcome measures.

The state of the art with respect to the development of worksite health promotion programs (WHPPs) was examined by Maes & Van der Doef (2004) and they distinguished five consecutive stages. In the first stage interventions were focused on the quality of the product and physical safety, well-being of employees was not perceived as a direct goal. In the second stage increasing attention was paid towards the well-being of managers. Stress-management programs and/or physical fitness programs were available for them, but not for other employees. During the third stage of WHPP, the concept of disease and accident prevention became central: the reduction of recognized health risks (such as smoking and other unsafe behaviors, hypertension and high serum cholesterol) was the focus of a range of interventions that consisted primarily of behavioral advice following screening procedures. In the fourth stage,

wellness programs were introduced and offered to all employees. During this stage, health promotion, instead of disease prevention, became the ultimate goal. These worksite interventions included 1) periodic or continuing delivery of educational or behavioral change materials, and activities that are designed to maintain or improve employee fitness, health and well-being, and 2) changes in the organizational practices and policies conductive to health promotion (Terborg, 1998, p. 204). To date, a fifth stage can be observed in worksite health promotion intervention programs, especially in Europe, Canada and Australia. Besides interventions focusing on lifestyles and health risks of employees, the fifth stage intervenes on quality of work aspects, which may be the real cause of problems in the area of well-being, health and safety.

The most well-known and most studied model on quality of work guiding fifth stage programs, is the JDC(S) model (Karasek, 1979; Johnson & Hall, 1988; Johnson et al., 1989; Karasek & Theorell, 1990). In general, this model states that higher levels of quality of work and well-being of employees are achieved through a balance between job demands, job control and social support at work. This means that an increased workload is not necessarily unhealthy for employees, when control at work and support from supervisors and co-workers also increase. Research shows that the work conditions defined by the JDCS model affect a wide range of employee well-being outcomes, namely job satisfaction, health complaints like anxiety and depression (in the work environment often called psychological distress), somatic complaints and burnout (emotional exhaustion, depersonalization and personal competence) (Johnson et al., 1995; Van der Doef, Maes, & Diekstra, 2000; Barnett & Brennan, 1997; Bakker, Demerouti, & Euwema, 2005; Demerouti, Bakker, Nachreiner, & Schaufeli, 2001; Häusser et al., 2010; De Jonge, Mulder & Nijhuis, 1999; Sundin, Hochwälder & Lisspers, 2011; Pisanti, Van der Doef, Maes, Lazzari & Bertini, 2011). Despite these findings, some researchers argue that the work conditions from the JDCS model should not be considered as the only predictors of well-being of health care employees (Van der Doef & Maes, 1999a; Kristensen, 1995). The organizational context, which is not addressed by the JDCS model, should also be taken into account (Parker, Wall, & Cordery, 2001; Tummers, Van Merode, & Landeweerd, 2002).

In order to gain a better understanding of the effectiveness of worksite health promotion programs for health care employees the following research questions were stated for this review:

- What are the effects of worksite health promotion intervention programs on quality of work and well-being of health care employees?
- Which intervention characteristics affect quality of work and well-being of health care employees?
- Which frameworks were used for the content and implementation of worksite health promotion intervention programs?

2.1 The effectiveness of worksite health promotion intervention programs in enhancing quality of work and well-being

Worksite health promotion programs can be divided into interventions aimed at individual employees and programs focused on the entire organization. Research in the tradition of individual focused interventions has demonstrated that there is a variety of interventions, for instance: relaxation training (for reviews see Murphy, 1984; 1996; Bamberg & Busch, 1996), and cognitive-behavioral interventions (Heaney, 1991; Curtis, 1992; Keyes & Dean, 1988; Kushnir, Malkinson & Ribak, 1994; Lee & Swanson Crockett, 1994; Von Baeyer & Krause, 1983) or interventions directed at health behavior change, like; increasing physical exercise, and improving dietary habits (Brox & Frøystein, 2005). These interventions are focused on improving health and well-being of individual employees in order to decrease absenteeism and turnover levels. Intervention studies directed at organizational change have also shown that the degree of organizational development (e.g., Golemblewski, Hilles, & Daly, 1987; Heaney, Price, & Rafferty, 1995), and of job redesign (e.g., Schurman & Israel in Murphy et al., 1995) can have important effects on quality of work and well-being of employees.

A more complete understanding of healthier occupational functioning in the long term, will require intervention programs directed at improvements for the individual employee as well as the organization as more than just a product of individual and organizational focused interventions. For that reason effective health promotion intervention programs must include different interventions targeted at the employees, management as well as the entire work environment. These, so called, multi-level interventions have been attracting increasing attention (Maes & Van der Doef, 2004). What many of these multi-level intervention programs share is an emphasis on complementary individual, organizational and environmental components, at multiple levels of an organization.

Another aspect of multi-level intervention programs is the use of a combination of a top down and bottom up approach. In this perspective, the management as well as the employees of an organization, participate in decision-making processes and cooperate to solve problematic issues within an organization (Lavoie-Tremblay et al., 2005; Arneson & Ekberg, 2005; Israel et al., 1996). In this combined approach of a top down and bottom up perspective, it is expected that the motivation of employees to actively participate in an intervention program will increase and is eventually more effective in improving quality of work and well-being of employees.

Studies included in the review

The databases Web of Science, Pubmed and PsycINFO were searched for studies between 1976 and 2011, containing the keywords: intervention, employee or

personnel, implementation, participating, health care, hospital, organization, worksite, health promotion, job satisfaction, burnout, depression, (dis)stress, anxiety, somatic and physical complaints, absenteeism, health promotion, job characteristics, job conditions, work characteristics, work(ing) conditions, job redesign, quality of work, wellness, and well-being. In addition, reference lists from recent reviews and empirical studies were consulted. Studies were included if the following criteria were met: 1) the language of the article is English; 2) the studies must be intervention studies with a quasi experimental design (pre- and post-test measurements) and include an intervention as well as a control group with a sample group larger than N=10; 3) interventions regarding health care employees at every level are included, from managers, to specialists, to nurses and nursing aides; 4) the articles must include a clear description of the research methods and intervention procedures and 5) the questionnaires that were used to measure quality of work and well-being of health care employees must have adequate reliability and be quantitative. Reports on qualitative measures and one-item measures were excluded. Ergonomic interventions were excluded. Studies not meeting these criteria were excluded from the review, resulting in twenty one studies.

2.2 Characteristics of worksite health promotion programs that reported quality of work and well-being effects in health care settings

In table 2.1 the characteristics of twenty one evaluation studies are presented. The results of the twenty one studies are described in terms of the following categories: a) intervention program, b) work conditions, c) job and work satisfaction, d) psychological distress, e) physical symptoms and somatic complaints, f) burnout, and g) absenteeism and turnover. Subsequently, conclusions concerning the effectiveness of these studies are presented. Several observations relating to the design and theoretical background of the studies will also be discussed.

Intervention program

A lot of variation exists among the intervention programs of the different studies. First of all, a distinction was made between person directed interventions and organization directed intervention programs. Eight studies were performed at an organizational level (Bourbonnais et al., 2006; Mikkelsen et al., 2000; Lokk & Arnetz, 2000; Boumans et al., 2008; Innstrand, Espnes & Mykletun, 2004; Krugman & Preheim, 1999; Pryce, Albertsen, & Nielsen, 2006; LeBlanc et al., 2007) and the remaining thirteen studies examined person directed intervention programs (Brox & Frøystein, 2005; Van Dierendonck, Schaufeli, & Buunk, 1998; Cohen-Katz et al., 2005; Delvaux et al., 2004; Gardner et al., 2005; Heaney, 1991; Kuske et al., 2009; Lee & Swanson Crockett, 1994; Roberts, Cerutti, & O'Reilly, 1976, Gardiner, Lovell,

& Williamsom, 2004; Hugenholtz, Schaafsma, Nieuwenhuijsen & Van Dijk, 2008; Jones & Johnston, 2000 and Tveito & Eriksen, 2008). Moreover, in each of the twenty one studies was assessed whether a top down approach, a bottom up approach or a combination of both approaches was applied in the intervention program. Seven studies included a top down as well as a bottom up approach (Innstrand et al., 2004; Pryce et al., 2006; Boumans et al., 2008; LeBlanc et al., 2007; Bourbonnais et al. 2006; Mikkelsen et al., 2000; Lokk & Arnetz, 2000). Two intervention studies used a bottom up approach (Gardiner et al., 2004; Hugenholtz et al., 2008). The twelve remaining studies included a top down approach (Tveito & Eriksen, 2008; Cohen-Katz et al., 2005; Van Dierendonck et al., 1998; Krugman & Preheim, 1999; Brox & Frøystein, 2005; Delvaux et al., 2004; Gardner et al., 2005; Heaney, 1991; Jones & Johnston, 2000; Kuske et al., 2009; Lee & Swanson Crockett, 1994 and Roberts et al., 1976).

The eight studies that included interventions directed at the organizational level and applying a combination of a top down/bottom up approach, all used different intervention programs and the effect variables also differed per study. Only one variable did correspond in five of the eight studies and the effects were similar in four studies: Bourbonnais et al. (2006), LeBlanc et al., (2007), Lokk & Arnetz (2000) and Mikkelsen et al. (2000) measured job demands and all found a significant favorable effect. Boumans et al. (2008) however, found an unfavorable intervention effect for the intervention group.

The person directed intervention methods also varied greatly; in seven studies more than one intervention method was applied (Roberts et al., 1976; Tveito & Eriksen, 2008; LeBlanc et al., 2007; Brox & Frøystein, 2005; Van Dierendonck et al., 1998; Hugenholtz et al., 2008 and Gardner et al., 2005). Because the combination of intervention components differed between studies, a clear conclusion about the effectiveness of each intervention or the separate components in an intervention program, can not be drawn. However, one exception is found, Brox & Frøystein (2005) and Tveito & Eriksen (2008) used similar intervention components in their program, both included 1) exercise classes, 2) nutrition classes and 3) stress management training. In both studies no significant effects on health related quality of life and (health) complaints were found. Furthermore, no theoretical framework was explored in both studies and therefore no conclusions can be drawn in this respect. The different intervention strategies that were evaluated in the remaining person directed intervention programs were stress management and relaxation training (Cohen-Katz et al., 2005; Gardner et al., 2005; Gardiner et al., 2004; Tveito & Eriksen, 2008; Brox & Frøystein, 2005; Jones & Johnston, 2000), social skills (and communication) training (Heaney, 1991; Lee & Swanson Crockett, 1994; Delvaux et al., 2004; Van Dierendonck et al., 1998 and Roberts et al., 1976), education, knowledge and skills

training (Kuske et al., 2009) and cognitive behavioral training (Gardner et al., 2005; Gardiner et al., 2004 and; Van Dierendonck et al., 1998).

Problem solving techniques were implemented in six studies in this review. A problem solving approach can be applied in a personal setting, where the individual employee learns how to solve problems at the worksite. On the other hand, a problem solving approach can also be used to solve organizational problems. LeBlanc et al. (2007) used problem solving sessions as part of a stress management program, applying a participatory action research approach on a personal and team level of 29 hospital wards. In the study by Lokk et al. (2000), health care personnel participated in practical problem solving discussions in combination with education about stress, and was directed at solving problems in two organizations. A comparable participatory intervention approach was used by Innstrand et al. (2004). In the study by Mikkelsen et al. (2000) the employees participated in meetings to learn how to identify and solve work problems in the organization. A participatory intervention was implemented by Pryce et al. (2006), where employees were involved in structuring and planning of shifts. Finally, Roberts et al. (1976) included a problem solving training in combination with a communication training at a personal level, which was effective in improving job satisfaction. The effects on quality of work and well-being again varied between studies. Mikkelsen et al. (2000) found favorable intervention effects on work related stress, demands, social support and role harmony. LeBlanc et al. (2007) found favorable effects on participation in decision making and on emotional job demands and an unfavorable intervention effect on social support. The intervention by Lokk & Arnetz (2000) was effective in improving work demands, work feelings and work comfort, while Innstrand et al. (2004) found favorable effects on stress, emotional exhaustion and job satisfaction. The intervention by Pryce et al. (2006) improved employee satisfaction, (psychological dis)stress and social support. Finally, Roberts et al. (1976) also found a favorable intervention effect on job satisfaction. Overall, consistent favorable effects of problem solving interventions were found on job satisfaction and job demands.

Due to the variety of levels of intervention, intervention methods and effect variables in the intervention programs, it is challenging to draw conclusions about the relative effectiveness of these intervention programs in relation to the outcome variables. However, the results suggest that a participatory approach using problem solving techniques directed at an organizational level as well as at a personal level, might be an effective intervention approach to improve quality of work and well-being of health care employees.

Work conditions

The JDCS-model and other work conditions were evaluated in ten studies. The intervention effects on job demands were examined in six studies. LeBlanc et al. (2007), Mikkelsen et al. (2000), Lokk & Arnetz (2000) and Bourbonnais et al. (2006) found a favorable effect on job demands. In addition, Tveito & Eriksen (2008) did not find a significant intervention effect and Boumans et al. (2008) found an unfavorable effect on job demands.

Job control was also evaluated in six studies and was also operationalized as autonomy, participation in decision making, decision latitude and skill discretion. Autonomy was affected favorably by the intervention of Boumans et al. (2008). In addition, a favorable intervention effect on participation in decision making was found by LeBlanc et al. (2007) and Bourbonnais et al. (2006), while Mikkelsen et al. (2000) found no significant effect on decision latitude and skill discretion. Furthermore, a non-significant effect on autonomy was reported by Mikkelsen et al. (2000) and Tveito & Eriksen (2008), Lokk & Arnetz (2000) and LeBlanc et al. (2007) reported a non-significant intervention effect on job control.

The effects of interventions on social support were examined in nine studies. A favorable effect on social support was reported by LeBlanc et al. (2007), Mikkelsen et al. (2000) and Pryce et al. (2006). Addionally, Boumans et al. (2008), Bourbonnais et al. (2006) and Heaney (1991) found a far favorable effect on social support from supervisors. Boumans et al. (2008) and Bourbonnais et al. (2006) however, found an unfavorable effect on social support from co-workers. Furthermore, non-significant results on social support were reported by Van Dierendonck et al. (1998), Gardner et al. (2005) and Lokk & Arnetz (2000).

Two studies focused, next to the JDCS model, on the Effort Reward Imbalance (ERI) model. Bourbonnais et al. (2006) found favorable intervention effects on reward and effort reward imbalance. In the study by Tveito & Eriksen (2008) no significant effects were found.

In general, the most favorable affected work conditions by the intervention programs were job demands (four out of six studies) and social support (six out of nine studies). Besides, the specific characteristics of the effective intervention programs were that the interventions were mostly focused at the organizational level and implemented top down as well as bottom up.

Job and work satisfaction

Job satisfaction is a well-known and often used outcome variable in worksite health promotion research. However, job satisfaction was examined as an outcome measure in only seven out of the twenty one studies included in this review. Roberts et al. (1976) used a general job satisfaction questionnaire next to a more specific one. Delvaux et

al. (2004) used an occupation specific questionnaire, that measured nurse satisfaction as well as patient satisfaction. Because job satisfaction was operationalized in different manners, it is difficult to compare the results. In addition, Brox & Frøystein (2005) did not mention the specific questionnaire that was used to measure job satisfaction, which makes it hard to assess the validity of the results in this study. Furthermore, regarding the intervention effects, Roberts et al. (1976), Pryce et al. (2006) and Innstrand et al. (2004) found a significant, favorable effect on job satisfaction. Brox & Frøystein (2005), Hugenholtz et al. (2008), Krugman & Preheim (1999) and Delvaux et al. (2004) found no significant effects.

Overall, favorable intervention effects on job satisfaction were found for two studies that included a participatory approach and a combination of a top down and bottom up implementation approach of the interventions, directed at an organizational level. In addition, two of the interventions directed at a personal level and with a top down approach did not affect job satisfaction.

Psychological distress (Anxiety & Depression)

Ten studies included in this review measured psychological distress as an outcome variable and it is the most frequently measured outcome variable. In these studies psychological stress was operationalized in different manners: (psychological) distress (Cohen-Katz et al., 2005; Bourbonnais et al., 2006; Gardner et al., 2005), work-related or job stress (Mikkelsen et al., 2000; Tveito & Eriksen, 2008; Gardiner et al., 2004), general (di)stress, (Gardiner et al., 2004; Gardner et al., 2005; Innstrand et al., 2004), self-reported stress (Lee & Swanson Crockett, 1994), nurse stress (Delvaux et al., 2004) and anxiety and depression (Jones & Johnston, 2000). The effects of the intervention programs on psychological distress were varied. No intervention effects were found in the studies by Cohen-Katz et al. (2005), Tveito & Eriksen (2008), and Bourbonnais et al. (2006), while other studies did reveal significant favorable effects (Lee & Swanson Crockett, 1994; Gardner et al., 2005; Mikkelsen et al., 2000; Innstrand et al., 2004; Jones & Johnston, 2000; Delvaux et al., 2004). Gardiner et al. (2004) found a favorable intervention effect on general psychological distress, however a non significant result was found for work related distress. In two studies (Tveito & Eriksen, 1998; Jones & Johnston, 2000) coping mechanisms were analysed in relation to the effectiveness of the intervention programs. No significant intervention effect for coping was found in the study by Tveito & Eriksen (1998). Jones & Johnston (2000) did find a significant favorable effect for direct coping, but not for general coping.

Overall, most intervention studies affected psychological distress favorable (seven out of ten). Furthermore, the interventions that included psychological distress as an outcome can be characterized as top down interventions and focused on a

personal level. Moreover, three out of four stress management interventions found a favorable effect on psychological distress.

Physical symptoms & somatic complaints

Physical symptoms and somatic complaints were measured in seven intervention studies of the twenty one discussed in this review. The seven studies operationalized physical symptoms and somatic complaints in three different ways and seven different instruments were used. Mikkelsen et al. (2000) measured health complaints, Kuske et al. (2009), Brox & Froystein (2005) and Tveito & Eriksen (2008) measured (health) complaints and Lokk & Arnetz (2000) and Pryce et al. (2006) measured (psycho) somatic symptoms. Brox & Froystein (2005) did not report the questionnaire that was used to measure health complaints, which makes it hard to assess the validity of the results. In addition, Jones & Johnston (2000) measured general health as an outcome. As to the results of these studies Kuske et al. (2009) found a significant favorable intervention effect on health complaints in the relaxation group, but not in the experimental group. Jones & Johnston (2000) also found favorable intervention effects at both post-measurements. In addition, no significant intervention effects were found in the studies by Pryce et al. (2006), Lokk & Arnetz (2000), Tveito & Eriksen (2008), Mikkelsen et al. (2000) and Brox & Froystein (2005).

In general, the intervention programs did only have a favorable effect on physical symptoms and somatic complaints in two of the seven studies. Besides, these intervention studies used a top down approach and were focused at a personal level.

Burnout

From the twenty one studies included in this review eight measured burnout or the burnout sub scales (emotional exhaustion, depersonalization and personal accomplishment). Four of the studies used the same burnout measure: the Maslach Burnout inventory or a translated version (LeBlanc et al., 2007; Van Dierendonck et al., 1998; Cohen-Katz et al., 2005; Kuske et al., 2009). An advantage of using the same questionnaire is that study results are easy to compare to each other. However, Kuske et al. (2009) reported results on the total scale and LeBlanc et al. (2007) included only emotional exhaustion and depersonalization in their study. Moreover, Van Dierendonck, et al. (1998) and Cohen-Katz et al. (2005) reported results on the three separate burnout scales. Furthermore, Bourbonnais et al. (2006) used a questionnaire that measured three kinds of burnout (work related, personal and client related). Lokk & Arnetz (2000) used one item to measure the level of burnout, which does not seem to be very reliable or valid. With regards to the intervention effects on burnout, LeBlanc et al. (2007) found no significant effects for emotional exhaustion and depersonalisation. Van Dierendonck et al. (1998) found a favorable effect for

emotional exhaustion, but not for personal accomplishment. Cohen-Katz et al. (2005) found favorable effects on emotional exhaustion and personal accomplishment, but not for depersonalization. Innstrand, et al. (2004) found a favorable intervention effect on emotional exhaustion, but no effects were found for depersonalization and personal accomplishment (professional self efficacy). Lokk & Arnetz (2000), Boumans et al. (2008) and Kuske et al. (2009) did not find significant effects in their studies. At last, Bourbonnais et al. (2006) found a favorable intervention effect on work-related burnout, but no significant effect for client related burnout and personal burnout.

In general, some of the interventions were effective in improving emotional exhaustion (three out of eight studies), while the interventions did not affect depersonalization and personal accomplishment improved in only one study.

Absenteeism and turnover intention

Three of the twenty one studies considered the effects of health promotion intervention programs on absenteeism and two studies examined the effects of the interventions on turnover. Brox and Frøystein (2005) measured absenteeism by analyzing the number of days of sick leave during the intervention period of seven months and found no significant intervention effect. Van Dierendonck et al. (1998) also counted days of sick leave during the 12-month intervention period and found a favorable intervention effect. They measured turnover intention with a single item on a six-point scale and found a favorable effect for the intervention group. Tveito & Eriksen (2008) measured sick leave the year before the intervention, the year during the intervention and the year after the intervention. However, no significant effects were found in this intervention study.

Overall, the interventions including absenteeism and turnover intention were all on a personal level and used a top down approach. Only one study had favorable intervention effects on absence duration and turnover intention.

Table 2.1 Overview of worksite health promotion interventions for health care employees from 1976 to 2011.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Brox & Froystein, 2005	Exp.: 65 Ctr.: 64	Employees of a nursing home. Norway.	Quasi exp. Random T2: 6mts	Personal level/Top down Weekly light group exercise for 1h + additional classes regarding physical exercise, nutrition and stress management.	Leisure-time physical activity HRQL, sickness absence, complaints & job satisfaction	P<0.01 NS	+
Boumans et al., 2008	Exp: N=71 Ctr: N=53	Caregivers in a nursing home. Netherlands.	Quasi exp. T2: 24 mts	Organizational level/Top down & bottom up Implementation of an integrated care intervention: 1) create a homelike environment, 2) work according to a demand-oriented working method, 3) integration of services.	Autonomy (psycho geriatric) Job demands (psycho geriatric) Social support supervisor (all) Social support colleagues, emotional exhaustion	P=.005 P<.000 P<.004 NS	+ - +
Bourbonnais et al., 2006	Exp.:302 Ctr.: 311	All care providers from two hospitals. Canada.	Quasi exp. T2 1 yr Not random	Organizational level/Top down & Bottom up Changes undertaken by the hospital to reduce adverse job psychosocial factors (psychological demands, decision latitude, social support, and effort-reward imbalance). Solutions proposed by an intervention team and adopted by the nursing department as well as any other objective change introduced with the explicit goal (or actual consequence) of improving one of the four targeted psychosocial factors was considered part of the intervention.	Psychological demands Reward Effort/reward imbalance Work related burnout Supervisor support Decision latitude, co-worker support, psychological distress, sleeping problems, client related burnout & personal burnout	P=.015 P=.001 P=.002 P=.034 P=.028 NS	+ + + + -
Cohen-Katz et al., 2005	Exp.: 12 Ctr.: 13	Hospital nurses. US.	Quasi exp. Not Random T2: 8 wks T3: 3 mts.	Personal level/Top down Mindfulness-based Stress Reduction (MBSR). 8-week program that meets approximately 2.5 hours a week and includes a 6-hour daylong retreat between the 6th and 7th weeks.	Mindfulness attention awareness Emotional Exhaustion Personal accomplishment, Depersonalization & psychological distress	P=.004 (T2+ T3) P=0.01 (T2+ T3) NS	+ +

Table 2.1 Continued.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Delvaux et al., 2004	Exp.:57 Ctr.: 58	Oncology nurses from 33 different institutions. Belgium.	Quasi exp. Not Random T2: 3 mts T3: 6 mts	Personal level/Top down Psychological training program divided over 3 months. Each month one training week (5 consecutive days). Including: 30 h of theoretical information and 75 h of role-playing exercises and of experiential exchanges. Topics: basic communication components in oncology, psychosocial dimensions associated with cancer and its treatment, coping with patients' uncertainties and distress, detecting psychopathologic reactions to diagnosis and prognosis, and discussing death and euthanasia.	Job Attitudes Nurses Stress Scale total score Patient satisfaction Nurses satisfaction	P<.05 (T2+T3) P<.05 (T2+T3) P<.01 (T2+T3) NS	+ + +
Dierendonck, Schaufeli & Buunk, 1998	1 exp: 36 Int ctr: 39 Ext ctr: 74	Care staff for with mentally disabled. Netherlands.	Quasi exp. T2: 6 mts T3: 1 yr Not random	Personal level/Top down Cognitive restructuring exercises that were based on equity theory 5 weekly group sessions of one morning or afternoon supervisors participated in workshop to train their communication and social skills. 3 group meetings.	Emotional exhaustion Absence duration Turnover intention Perceived social support, depersonalization & personal accomplishment	P=.02 (T3 Ext.) P=.05 P<.000 (T3 Int.) NS	+ + +
Gardner et al., 2005	Exp1.: 57 Exp2: 44 Ctr: 37	Employees from National Health Service. UK.	Quasi exp. Random T2: 3 mts	Personal level/Top down Three workshops of 3.5h with weekly intervals Two exp. groups: 1) cognitively based stress management training, 2) behavioural stress management training.	General distress (Exp1) Support at work	P=0.005 NS	+
Gardiner, Lovell & Williamson, 2004	Exp: N=77 Ctr: N=19	General practioners. Australia.	Quasi exp. T2: 4wks	Personal level/Bottom up A 5 week (15 h) cognitive behavioural stress management course	General psychological distress Work related distress	P=.001 NS	+

Table 2.1 Continued.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Heaney 1991	Exp.: 495 (52/495 ppt. in one or more session) ctr. Idem	Direct care empl+house managers in homes for (develop) mentally ill. US.	Quasi-exp./PPT Random T2: 5 wks	Personal level/Top down 3 sessions: 1) introduction of new network ties for participants, 2) training participants in social supports concepts and skills, 3) training of important network members in skills to be more supportive	Supervisor support (participant group only) Supervisor undermining	P<.01 P<.01	+ +
Hugenholtz, Schaafsma, Nieuwen-huijsen & van Dijk, 2008	Exp: N=28 Ctr: N=43	Occupational physicians. Netherlands.	Quasi exp. T2: 22 wks T3: 7mts	Personal level/Bottom up Intervention of evidence based medicine course in combination with case method learning sessions	Professional performance Job satisfaction	P<.001 NS	+
Innstrand, Espnes & Mykletun, 2004	Exp: N=36 Ctr: N=11	Empl. working with intellectual disabled. Norway.	Quasi exp. T2:10mts	Organizational level/Bottom up & top down Participatory approach, using problem solving techniques and goal setting. Intervention program is created by employees themselves. Additional exercise program and health seminars.	Stress Emotional exhaustion Job satisfaction Cynicism, professional self efficacy	P<.05 P<.05 P<.05 NS	+ + +
Jones & Johnston, 2000	Exp: 40 Ctr: 39	Student nurses. Scotland.	Quasi exp. T2: 7 wks T3: 19 wks	Personal level/Top down Stress management intervention/ coping intervention. Six 2-hour sessions	General health T2 + T3 Anxiety T2 + T3 Depression T2 + T3 Direct coping T2 + T3	P<0.0005 P<0.0005 P=0.004 P=.08	+ + + +
Kuske et al., 2009	Exp: 68 Relax:68 Ctr: 74	Employees from six nursing homes. Germany.	Quasi exp. T2: 13 wks T3: 6 mts	Personal level/Top down 13 1-hour training sessions weekly: A key focus was to improve the caregivers' knowledge and competencies for dealing with residents with dementia, including 1) sensitization to the experience of residents, 2) communication competencies and 3) special and adjuvant care methods requiring little effort.	Level of health complaints (relax gr) Burnout	P=.035 (T2+T3) NS	+

Table 2.1 Continued.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Krugman & Preheim, 1999	Exp: N=55 Ctr: N=50	Nurses. US.	Quasi exp. T2: 2 yrs	Organizational level/Top down Reorganization in hospital: unit visioning, formation of staff action self-governance committees, staff-designed change, implementation of planned change, evaluation & reformation of activity.	Job Satisfaction	NS	
LeBlanc et al., 2007	Exp: 260 Ctr: 404	Care providers from 29 oncology wards from 18. hospitals. Netherlands.	Quasi exp. Random Self-selected T2: 6 mts T3: 1 yr	Organizational level/ Bottom up & top down Participatory action research approach Stress management program. Educational and problem solving sessions. 6 monthly sessions of 3 hrs	Participation in decision making T2 Emotional Job demands Social support Emotional exhaustion, depersonalization, work load, job control	P=0.03 P=0.05 P=0.04 NS	+ + -
Lee & Swanson Crockett, 1994	Exp: 29 Ctr: 28	Nurses. China.	Quasi exp. Random T2: 2 wks T3: 4 wks	Personal level/Top down Assertiveness training. Six 2-hour sessions in two consecutive weeks. The content: introducing the concept of assertion, identifying and accepting human rights, identifying irrational beliefs and negative self-statements, building a positive belief system, applying assertion to clinical settings, and developing group and self-reinforcement support systems.	Self reported stress Assertiveness	P<.01 (T2+T3) P<.01 (T2+T3)	+ +

Table 2.1 Continued.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Lokk & Arnetz, 2000	Exp: 14 Ctr: 12	Employees from two separate geriatric wards. Sweden.	Quasi exp. T2: 20 wks T3: 30 wks	Organizational level/Top down & Bottom up 10-sessions of 1 hour for 20 weeks, support and advice. Intervention during organizational change. Educational about stress followed by a practical problem-solving discussion. 6 core topics: (1) exploring problems swiftly; (2) reinforcing constant dynamics and need of improvement rather than stagnation; (3) questioning the past and present of the organization; (4) allowing mistakes and using them as a learning opportunity; (5) learning both about the individual person and the organizational reaction patterns; (6) allowing new knowledge to lead to new modes of action.	Work demand Work feelings Work comfort Social support, psychosomatic symptoms, work control & burnout	P<.05 (T3) P<.05 (T3) P<.001 (T3) NS	+ + +
Mikkelsen, Saksvik & Landsbergis, 2000	Exp.: 47 Ctr: 35	Supervisors and employees of health care institutions. Norway.	Quasi exp. Not random T2: 1 wk	Organizational level/Top down & Bottom up The overall aim of the intervention was to set into motion a learning process on how to identify and solve work problems. Experimental groups identified the problems themselves One 6-h seminar and 9 individual 2h group meetings.	Work-related stress Demands Social support Role harmony Subjective health, skill discretion, decision authority & autonomy	P<0.05 P<0.05 P<0.05 P<0.05 NS	+ + + +

Table 2.1 Continued.

Study	Sample size	Population	Design	Intervention	Effect Variables	P	
Pryce, Albertsen & Nielsen, 2006	Exp: N=86 Ctr: N=91	Nurses from a psychiatric health care center. Denmark	Quasi exp. T2:20 mts	Organizational intervention/ Top down & bottom up Introduction of a open rota system, in which nurses design their own work schedules. A participatory approach whereby employees were involved in every stage of the intervention. The teams within the intervention group were invited to attend a 1-day workshop in which case studies of work scheduling interventions were presented.	Satisfaction Somatic symptoms Social Support	P<.001 NS P<.001	+ +
Roberts, Cerruti & O'Reilly, 1976	Exp 1: 16 Exp 2: 28 Ctr 1: 19 Ctr 2: 25	Emergency room personnel in a general hospital. US.	Quasi-exp. (Solomon 4 group design) Not random T2: 4 wks	Personal level/Top down 4 weekly training sessions (2.5-3 hr each) communication training group problem solving training	Job satisfaction	P<0.005	+
Tveito & Eriksen, 2008	Exp: 12 Ctr: 17	Employees from a nursing home for older people. Norway.	Quasi exp. T2: 9mts T3: 1 yr	Personal level/Top down Physical exercise (1 hour 3 times a week for 9 mts), health information/ stress management training (1 hour per week for 4 mts) and a practical examination of the workplace.	Subjective health complaints, sick leave, coping, job stress, effort reward imbalance, demands, control, health related quality of life	NS	

Note. Exp= experimental group, Ctr = control group, mts=months, yr=year, wks=weeks, Cond = Condition, NS = not significant, P=probability, T2=effect found at T2, T3=effect found at T3, += favorable intervention effect, -=unfavorable intervention effect, Ext.=external control group, Int. = internal control group.

2.3 Conclusions concerning the effectiveness of worksite health promotion interventions enhancing quality of work and well-being among health care employees

In answer to the first research question, the forgoing review illustrates that the most consistent favorable effect has been reported for job demands. Besides job demands, social support was also favorably affected by WHPPs in several studies. Concerning the well-being outcomes, psychological distress was frequently favorably affected by WHPPs. In addition, job satisfaction was favorably affected by worksite interventions that used a combination of a top down and bottom up implementation approach. In answer to the second research question, several intervention characteristics seem to affect quality of work and well-being of employees, namely organizational and personal directed interventions, top down and bottom up interventions, problem solving techniques and interventions directed at improving the work conditions of the JDCS model. WHPP that included the work conditions of the JDCS-model, were not evaluated on job satisfaction and therefore no conclusions can be drawn about the relation between these variables. Furthermore, intervention programs, that were on a personal level with a top down approach and including a stress management program positively affected mostly psychological distress. In addition, to answer the third research question on which frameworks were used for the implementation of worksite health promotion programs, two theoretical approaches can be distinguished. Firstly, the JDCS-model (Karasek, 1979 and Johnson et al., 1995) as the problematic work conditions of this model served mostly as the content of a WHPP. Secondly, a participatory approach to implement a WHPP appeared to be effective in six intervention studies.

On the basis of these findings no firm conclusions can be drawn about how worksite interventions affect quality of work and well-being of employees in health care settings. However, it seems that interventions including a problem solving approach are effective in improving quality of work and well-being of health care employees and stress management programs are effective in improving psychological distress at a personal level. Furthermore, absenteeism is not affected by interventions including stress management training for employees working in health care. These effects are based on a small amount of studies and it is quite possible that more intervention methods or components are effective, while others are not. Additionally, there are several methodological implications that might have prevented us from finding unambiguous results. First of all, the time-span of the intervention programs varied greatly (column 5, table 2.1) between the studies in this review. Some programs had a very short duration, for example: the intervention by Gardner et al. (2005) used three group meetings in six weeks. Other interventions had a longer intervention period, for example: Bourbonnais et al. (2006) implemented an intervention program directed

at organizational change, that was evaluated after one year and had no predetermined endpoint. Besides, the intervention of Boumans et al. (2008) was implemented in two years. Because none of the studies had similar intervention periods, no conclusions can be drawn concerning this issue on the effectiveness of the interventions programs. However, the expectation is that intervention programs with a longer duration might be more effective (Bourbonnais et al., 2006).

A second distinction between the studies is the period between the baseline measurement and follow up measurements. Eleven studies included two measure moments (before and after the intervention program) and the remaining ten studies included three measure moments (one measure moment before the intervention program and two measure moments after the start of the intervention program to measure long term effects). The time between the baseline measurements and T2 measurements ranged from one week to two years and the time between baseline and T3 measurements ranged from four weeks to one year. Overall, the long term intervention studies in this review were mainly on an organizational level, used a combination of a top down and a bottom up approach, and included two measure moments (Boumans et al., 2008; Bourbonnais et al., 2006; Krugman & Preheim, 1999 and Pryce et al., 2006).

The third methodological issue concerns the samples. Table 2.1 shows that the samples between intervention studies vary. Although all studies were carried out in a health care setting, different groups of employees were studied. Most research focused on nurses and orderlies, but Heaney (1991) focused on managers as well as direct caregivers, Gardiner et al. (2004) on general practitioners and Mikkelsen et al. (2000) on managers and supervisors. Some studies included both higher level and lower level functioning employees (Mikkelsen et al., 2000; Heaney, 1991) in the intervention, but they did not differentiate between these groups in the analyses of the data. It has been suggested that the effectiveness of intervention programs will increase when they are applied at function groups within an organization (Maes & Van der Doef, 2004). In these intervention programs, policy makers, managers, care employees, but also supporting staff (such as cleaning and catering staff) must be included in the screening and implementation of the intervention program (Maes & Van der Doef, 2004). In five of de twenty one studies this was the case (Brox & Froystein, 2005; Heaney, 1991; Lokk & Arnetz, 2000; Mikkelsen et al., 2000; Tveito & Eriksen, 2008).

2.4 Discussion and implications for further research

After reviewing the findings of twenty one WHPPs, it is found that a variety of interventions are used to improve quality of work and well-being outcomes of health care employees. Most interventions have indeed a favorable effect on work conditions and well-being outcomes. The results further suggest that a participatory approach

is effective in improving quality of work and that stress management training is effective in improving psychological distress in health care employees. It remains for the large part unclear which (combination of) components of the intervention programs are effective in improving quality of work and well-being. Along the same line, it was argued that answering the question which components are most effective in worksite health promotion intervention programs is obscured by the heterogeneity of outcome variables, research groups, follow up period, and other methodological issues and theoretical premises. For example, in six studies in this review problem solving interventions were implemented, but no solid conclusions could be drawn on the effectiveness of these intervention techniques, due to differences in effects, duration of the programs and sample groups. Drawing a firm conclusion about common characteristics of successful intervention programs is further hindered by the absence of a comprehensible framework for guiding the implementation process in WHPPs. There appears to be no definitive answer as to what works, how and why. Additionally, the philosophy of just trying everything that is available in terms of intervention methods – 'the more the better' – is not supported by empirical evidence; some complex intervention programs actually affected the intervention group negatively. This is well illustrated by a study of Petterson & Arnetz (1998), where e.g. an unfavorable intervention effect was found for psychosomatic complaints, in an intervention program that included a variety of interventions, without a theoretical implementation framework to support the intervention.

The third research question regarded theories and models that so far have been applied in WHPPs studies and their effectiveness. We concluded that in recent occupational intervention studies, the JDCS-model (Johnson & Hall, 1988; Johnson et al., 1989; Karasek & Theorell, 1990) is the most applied theoretical model. The model provides a theoretical background for a large amount of studies, that focus on the influence of a set of work characteristics on the well-being of employees (for reviews see Van der Doef & Maes, 1998; 1999a; Häusser, et al., 2010). Although much research is done with the JDCS-model, only nine intervention studies in health care settings were found to include one or more of the work conditions from the JDCS-model. In addition, although positive effects on job demands and social support were found, the variety in intervention strategies and time lines prevented conclusions about how the interventions affected job demands, control and social support. In addition, the JDCS model has been criticized for explaining only a part of the variance in job satisfaction and other well-being outcomes (Van der Doef & Maes, 1999a; Kristensen, 1995). Other work conditions, such as job insecurity and role ambiguity, are also predictors of employees` health and well-being (Boya et al., 2007; Andrea, Bultmann, Van Amelsvoort & Kant, 2009), but were only included in one study (Mikkelsen et al., 2000).

Apart from the content of the intervention program, like quality of work factors, additional comprehension of occupational functioning requires an implementation perspective on improving employee behavior as more dynamic and motivationally anchored. What is missing in previous research is a problem solving implementation approach, that guides the process of the intervention program and can explain what might work, how and why. This is illustrated by the study of Bourbonnais et al. (2006). Here, a large scale intervention, consisting of many components, is implemented and several positive effects are reported. A participatory approach is used in this intervention program, to change adverse work conditions (ERI-model and JDCS-model). This approach aimed to determine what changes should be introduced to reduce adverse psychosocial work factors and the best way to implement these changes. A problem solving perspective however, (D'Zurilla & Goldfried, 1971, Watson & Tharp, 2006; Ziegenfuss, 2002; Bandura, 1989; Emmons, 1986, 1989, 1997; Gollwitzer & Bargh, 1996; Gollwitzer & Moskowitz, 1996), which shares similarities with the participatory approach, shows an emphasis on the goal directed, problem solving, pro-active and monitoring aspects of employee functioning and could guide the implementation of future interventions. The distinctive differences between the two approaches are firstly that problem solving has a clear theoretical base while a participative approach is less anchored in a theoretical framework. Secondly, a participative approach aims at cooperative rules to implement earlier set changes, while problem solving aims at problematic situations, applying a monitoring approach to improve these situations. For these two reasons, a problem solving approach was preferred.

CHAPTER 3

Theoretical perspectives on quality of work and worksite health promotion programs

Relationships between characteristics of the work environment and outcomes in health care employees, such as job performance and well-being, have been at the core of occupational functioning and worksite interventions. In the last two decades a lot of research has assessed the impact of work conditions on job satisfaction and well-being of health care staff (e.g. Elovainio & Kivimaki, 1996; Parker & Kulik, 1995; Taylor, White, & Muncer, 1999; Visser et al., 2003; Gelsema, Maes, & Akerboom, 2007). The effects of unfavorable work conditions are detrimental for both employees (job (dis)satisfaction and burnout) and employers (absenteeism and lowered productivity). Finding remedies for these problems is a desirable objective for health care organizations. Various occupational stress models such as the Effort Reward Imbalance (ERI) model has been utilized to study the impact of reward and effort reward imbalance on well-being outcomes of health care employees (Bourbonnais et al.,2006; Tveito & Eriksen, 2008), while the Job Demands Resources (JD-R) model has been used in many organizations as a tool of human resource management (Bakker & Demerouti, 2006). In numerous studies, the Job Demand Control Support (JDCS) model (Johnson & Hall, 1988; Johnson et al., 1989; Karasek, 1979; Johnson et al., 1995) has been applied as a theoretical framework, in which a set of work characteristics (viz., job demands, control or decision latitude, and social support) predicts employees' well-being (for reviews see Van der Doef & Maes, 1998, 1999a; Häusser et al., 2010). In the review of chapter 2 it is argued, that the JDCS model has been the most frequently used. Additionally, a problem solving approach was thought to be effective for the implementation process.

In the first section of this chapter the focus will be on the JDCS perspective because this model is the most commonly used en has been tested in over 100 empirical studies (Van der Doef & Maes, 1999a; Häusser et al., 2010). However, the JDCS model has been criticized for explaining only a restricted percentage of variance in health outcomes and measures of psychological strain. It is likely that the quality of work of employees is influenced by more environmental factors than only the work characteristics of the JDCS model. The second theoretical model that is found to be predictive of employee well-being is the Tripod Accident Causation model (Wagenaar, Groeneweg, Hudson, & Reason, 1994; Wagenaar, & Schrier, 1997). This model, that will be discussed in the second section of this chapter, considers especially the elimination of risks in the work environment as the primary strategy for prevention of negative outcomes for the organization. Additional comprehension of occupational functioning requires theories and models that do not only focus on work conditions and organizational risk factors, but also recognize the more goal directed aspects of person-environment interactions. Therefore, in the third section, a theoretical framework – namely the problem solving approach – is described to provide direction for the

implementation processes in worksite health promotion programs directed at quality of work in health care organizations and well-being of health care employees.

Combining the three theoretical perspectives on worksite health promotion programs, a monitoring approach for the implementation of worksite health promotion intervention programs in health care settings directed at quality of work and well-being is introduced. Here, the work conditions of the JDCS model and the organizational risk factors of the Tripod model, on the one hand, represent the content of the intervention program, while the problem solving approach, on the other hand, represents a monitoring approach to guide the implementation process. The practical implications of this approach are discussed in the final section of this chapter.

3.1 A work conditions perspective on quality of work

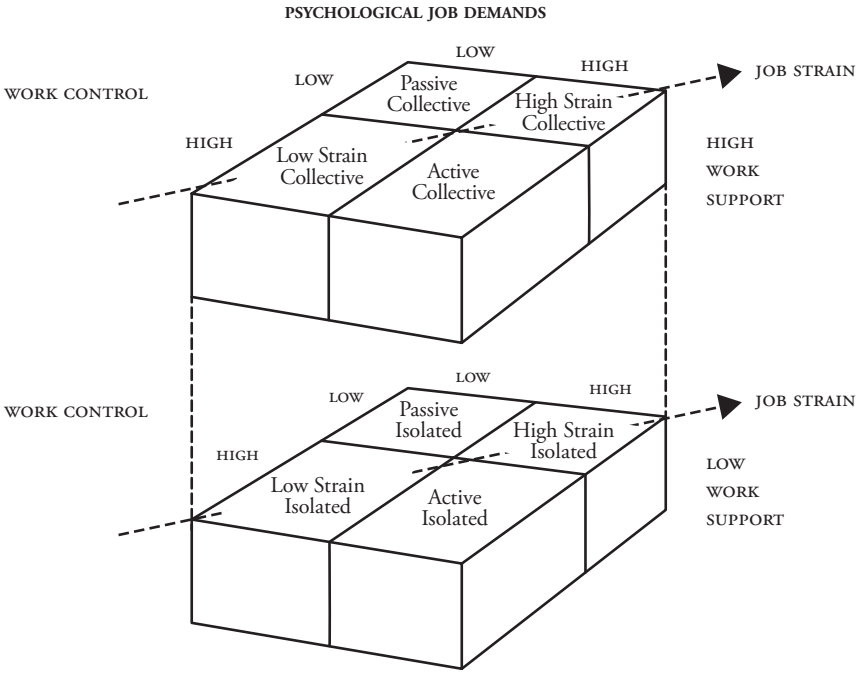
The Job Demand Control (JDC) model (Karasek, 1979) and its expanded version, the Job Demand Control Support (JDCS) model (Figure 3.1; Johnson & Hall, 1988; Johnson et al., 1989; Karasek & Theorell, 1990) are among the most influential models of occupational stress that focus on the impact of occupational conditions on employees' physical and psychological health. According to the JDC model the combination of job demands and job control results in the classification of four different types of work, which are labelled as 'high strain' work (high demands and low control), 'low strain' work (low demands and low control), 'active' work (high demands and high control) and 'passive' work (low demands and low control) (Landsbergis et al., 1992). Hence, the employees' health and well-being is considered to be determined by these two features of the JDC model. 'High strain' jobs are hypothesized to result in high risk of psychological and physical illness, while 'active jobs' are seen as precursors for increased motivation and learning. Jobs with high levels of demands and control are hypothesized to increase motivation, development of skills and learning. The expansion of the model with a social dimension showed that job control is not the only psychosocial resource available to manage demands of the work place. Social support of colleagues and supervisors in the workplace may also operate as a moderator of psychological (job) demands. The social aspect differentiates 'isolated' work (with hardly any options for social interaction) and 'cooperative' work (in which interaction with colleagues is integrated) (Van der Doef & Maes, 1998).

Job control (also referred to as decision latitude) includes two main aspects: decision authority (determined by the authority of an employee over what has to be done and how to manage the process) and skill discretion (determined by the skills an employee can develop and apply in the job). According to Karasek (1979), job control offers a resource, which can change the impact of the stressors since it permits the employee to make priority choices over job tasks. In addition, job control can be used to develop effective coping strategies to manage the demands related to accomplishing

the task. Earlier research, examining work stress and efforts aimed at its reduction, have shown the importance of job control and social support, two of the three factors of the JDCS model. In particular, the combination of control possibilities together with a supportive working environment seems to be crucial (Van der Doef et al., 2000; Johnson et al., 1995).

Focussing on physical health outcomes and psychological well-being, two hypotheses are frequently explored in the context of the JDC model (or the extended version – the JDCS model): 1) the (iso-)strain hypothesis (the combination of high demands, low control and low support predicts strain), and 2) the buffer hypothesis (control and social support buffer the negative effects of demands on health). In reviews on the JDC(S) model (Van der Doef & Maes 1998, 1999a; Häusser et al., 2010) a considerable amount of support for the (iso-)strain hypothesis has been found. The buffer hypothesis is supported in some studies on cardiovascular disease outcomes and psychosomatic complaints (Johnson & Hall, 1988). However, support for the buffer hypothesis is less consistent for well-being outcomes like depression, anxiety, job satisfaction and burnout. An important difference between supportive and non-supportive studies for the buffer hypothesis seems to be the conceptualization of job demands and control.

Figure 3.1 Job Demand-Support-Control model (Johnson & Hall, 1988, p. 1336)



Marshall, Barnett & Sayer (1997) propose that job control may not serve as a moderator for health care employees. According to Theorell & Karasek (1996) the balance between the three components of the JDCS model is most important. This means that, when job demands are increasing, for instance, because of understaffing, control and support aspects have to improve, ensuring that the competences and skills of all employees are extended. Of course these changes cause problems in organizations and requires flexibility among employees. However, when flexibility is required of the employees, Theorell & Karasek (1996) state that the need to develop job skills occurs as well as the opportunity to exert decision authority over their situation. Furda et al. (1994) found that a change in job conditions was related to a change in health complaints and they concluded that an increase in social support from colleagues prevented a negative effect of increased job demands.

An important advantage of this meaning of control and support for the employee is a sense of security. The paradox of this issue makes it clear that employees at least have to be motivated and competent to become more flexible and extend their decision authority and skills in a way they increase their quality of work. This point of view also implies that lack of motivation and competence of the management to develop a positive work climate may easily result in negative health outcomes for the employees (Ganster & Schaubroeck, 1991). The results of a longitudinal study by Van der Doef (2000) suggest that control and social support are important job conditions to take into account when trying to improve job satisfaction and employees' well-being. On the basis of the results, the researchers conclude that job redesign should not focus only on these job conditions, because job insecurity and role ambiguity were also important predictors for health care employees' health and well-being and so should be targeted as well. Based on these findings a new instrument was constructed to measure job conditions and an outcome measure, namely job satisfaction, called the Leiden Quality of Work Questionnaire –LQWQ- (Van der Doef & Maes, 1999b). The LQWQ is used in this study because this instrument provides a comprehensive measure of work conditions that can play a role in well-being outcomes of health care employees. For that reason the LQWQ is more suitable as a screening instrument to guide the construction of a worksite intervention program than a more restricted measure focusing only on the JDCS constructs.

Next to job conditions, organizational characteristics like training opportunities and communication seem to play an important role in the quality of work and well-being of employees. These organizational risk factors even appear to be a predictor for employee health and well-being (Akerboom & Maes, 2006). For that reason the impact of these risk factors will be examined in the next section to decide whether these aspects have to be added to the instrument for screening and evaluation of worksite health promotion intervention programs.

3.2 An organizational perspective on quality of work

A common critique of the JDCS model relates to its supposed simplicity (Akerboom & Maes, 2006). The model examines the determinants of work-related outcomes primarily in perceptions of job characteristics and, thus, includes only a few aspects of the work environment. In many studies the variance explained in the outcome measures is limited and the model's narrow scope is considered as an important reason for this finding (Van der Doef & Maes, 1999a; Kristensen, 1995). Further, it is argued that the model only outlines how job characteristics influence employees' well-being, but does not assign importance to the organizational context within which work tasks take place (Parker et al., 2001; Tummers et al., 2002). It has been recognized in models and theories of 'healthy work organizations', describing job and organizational aspects, which promote well-being of employees as well as organizational performance, that the organizational environment plays a crucial role in determining employee wellness (Jaffe, Peterson & Portney, 1995; Shoaf, Genaidy, Karwowski, & Huang, 2004). These models have proposed various factors as potential facilitators of organizational health, ranging from criteria for job design – and organizational strategies to support these criteria (Lindström, 1994) – to more macroscopic aspects of the organization environment – its culture and climate (Sauter, Lim, & Murphy, 1996). Empirical work on the topic of organizational health has documented correlations between various organizational characteristics and individual/organizational well-being measures (Lim & Murphy, 1999; Lindström, Schrey, Ahonen, & Kaleva, 2000; Sauter et al., 1996). Moreover, given that most research examines the impact of job characteristics on staff outcomes, research providing a clearer understanding of the significance of organizational characteristics for the well-being of care providers is limited (Akerboom & Maes, 2006).

The organizational characteristics considered in this study are derived from the Tripod accident causation model (Wagenaar, Hudson, & Reason, 1990; Wagenaar et al., 1994), in which contributing causes of accidents are traced back to 'systemic errors' in the way the organization functions. The reasons for using this model to identify and measure potential sources of stress at the organizational level are that (a) it offers a hierarchical perspective, which seems in line with arguments raised within the healthy organization approach (Cox & Cox, 1993; Shoaf et al., 2004), (b) it is empirically founded (Wagenaar, Hudson, & Reason, 1990), and (c) it is conceivable that the determinants of safety identified within the Tripod approach also underpin employee well-being. The concept that a set of job and organizational characteristics may improve some organizational and employee outcomes, is not new. For instance, models of healthy organizations take note that organizational performance and employees' health and wellbeing can be improved by a common set of antecedents (e.g., Shoaf et al., 2004). Barling and Zacharatos (2004) argued in

the same line, that the management of safety is no different from the management of organizational performance, and therefore that many of the determinants of organizational performance are likely to affect organizational safety as well. Drawing on these ideas, we propose that many of the determinants of safety, more specifically the safety-critical factors of the Tripod model, will also affect employee health and well-being.

A diagnostic tool, called Tripod Delta, and based on the Tripod accident causation model for accident prevention, is used to explore which of the organizational risk factors have to be added to the Leiden Quality of Work Questionnaire (Van der Doef & Maes, 1999b) for screening and evaluating the effects of interventions. Tripod Delta has been developed primarily for identifying structural deficits in an organization which incites cognitive failures (Hudson et al., 1995; Wagenaar et al., 1994; Wagenaar et al., 1990). Until the nineties, much of industrial accident prevention was aimed at the direct causes or 'active failures' of the accident causation process that often involved human errors.

The Tripod model postulates that unsafe acts take place, not as random events, but as patterns of reasoning or in psychological states of mind, called psychological precursors. These psychological precursors are the result of error promoting conditions elicited by the physical and organizational environment, the 'latent failures'. Besides the environment it is obvious that 'latent failures' are the result of inadequate management decisions. From this point of view, precursors of unsafe actions are the reactions to a situation, not only their source. Latent failures have been classified into eleven categories of inadequate organizational functioning, the General Failure Types (GFTs), which can be measured proactively and reliably with the Tripod Delta questionnaire (Hudson et al., 1995; Wagenaar et al, 1994). For a short description of each GFT, see table 3.1.

Table 3.1. The definitions of the 11 General Failure Types (GFTs) of the Tripod accident causation model (Akerboom & Maes, 2006, p. 24).

GFT[1]	Definition
Design	Ergonomically design of workplace and equipment
Hardware	Quality, condition, suitability or availability of materials
Maintenance management	Performance of maintenance tasks and repairs
Housekeeping	Orderliness and tidiness of the working and storage areas
Procedures	Usefulness and availability of procedures and instructions
Training	Quality of job related training and competence or experience among employees
Communication	Quality and effectiveness of communications between individuals, groups, or departments of a company
Incompatible Goals	Way safety is managed against a variety of other goals
Organization	Effectiveness of the organization's structure and processes, and management strategies
Error Enforcing Conditions	Quality of physical work conditions, work climate, and workers' physical and psychological condition
Defences	Quality of safety equipment and contingency planning and procedures

Note[1]: The scales shown in bold were included in the present study.

Akerboom & Maes (2006) argue that five (bold in table 3.1) of the eleven latent failures identified in the Tripod approach contributed to an extra amount of variance over the job conditions of the JDCS model on the positive outcomes (job satisfaction) as well as the negative outcomes (emotional exhaustion, psychological distress, somatic complaints). These five GFTs are: Communication, Organization, Incompatible Goals, Training, and Error Enforcing Conditions. Communication and training opportunities appeared to be of central importance to carers' job satisfaction (Akerboom & Maes, 2006). A plausible account for the mechanisms by which GFT's generate stress and resultant strain is offered by Schabracq (2003). He argued that working in a dysfunctional task environment makes it more difficult for an employee to 'blindly' proceed with his or her tasks, threatening his or her task performance or fulfillment of task-related goals, which eventually may lead to stress. A comparable suggestion is presented by Frese and Zapf (1994), and Semmer, Zapf and Dunckel (1995), who argue that conditions in the work environment that hinder regulation capacity (leaving less capacity for task completion) lead to disturbances of the regulation process to attain task-related goals. These disturbances in turn result in reduced well-being of employees.

Thus, it seems that taking organizational risk factors into account, when developing worksite intervention programs, appears to be relevant. In addition to work conditions and organizational factors, which are fairly well known characteristics of the work environment, we now introduce a problem solving approach that might be a fruitful approach to influence quality of work and wellness among employees.

3.3 A problem solving approach on quality of work and well-being

How the change process to improve quality of work should take place has received less attention in the literature. We suggested earlier a problem solving approach to change problematic factors at the work place (e.g.: Watson & Tharp, 2006; Ziegenfuss, 2002; D'Zurilla & Goldfried, 1971; Austin & Vancouver, 1996; Bandura, 1989; Gollwitzer & Bargh, 1996; Gollwitzer & Moskowitz, 1996). What many of these problem solving viewpoints share is a focus on the goal-directed and monitoring characteristics of behaviour. Explanations for action are sought in dynamic, problem solving techniques like monitoring, feedback, control processes, evaluation and reformulating goals. This problem solving perspective tends to view an organization from a learning and self steering perspective and may therefore be an effective framework for the implementation of worksite health promotion intervention programs. Moreover, the first phase of a problem solving approach is goal-setting, which appears to be an effective ingredient of interventions in solving problematic situations. According to Watson & Tharp (2006, p. 62): *"If you don't set goals, you won't get started, for there is no destination. Without both long- and short term goals, you won't keep trying."* Short-term goals provide the start and the long-term goals keep you on the journey (Locke & Latham, 1990, 1994, 2002). In addition, specific goals function as a standard or criterion of progress.

Although a diversity of definitions of problem solving exists, the term is commonly defined as "thinking about the obstacles to your progress and figuring out how to overcome them by defining the problem clearly, think of solutions and predict the consequences of various alternatives" (D'Zurilla, 1986; Kelly, Scott, Prue, & Rychtarik, 1985). For the purpose of interventions, a process definition is preferred over definitions which view problem solving as a personal resource or trait. A dynamic approach facilitates the assessment of problem solving components in terms of mechanisms and related skills, all of which can be influenced by means of systematic interventions. The problem solving perspective can be more specifically defined as a monitoring approach, occurring in four phases: 1) goal setting, shaping the process of change, 2) feedback process evaluation, 3) control procedures, 4) reformulate (realistic) goals), that requires the reflective implementation of various change and maintenance mechanisms that are aimed at organizational goals and performance-

specific outcomes (D'Zurilla & Goldfried, 1971; Watson & Tharp, 2006; Ziegenfuss, 2002).

In a problem solving intervention program both employees and managers assume an active rather than a passive role in the intervention program within the health care organization and this attitude requires more personal involvement than employees displayed earlier, so called bottom up processes (Lavoie-Tremblay, 2004; Lavoie-Tremblay et al., 2005; Arneson & Ekberg, 2005). Furthermore, Bourbonnais et al. (2006) studied the effectiveness of a participatory intervention program, where an active attitude was expected from the employees in the participating organization, and found positive results on job demands and work related burnout. Based on the study of Bourbonnais et al. (2006), it appears that an active, cooperative, problem solving approach of both employees and managers might be beneficial in worksite health promotion intervention programs. A problem solving approach is characterized by phases, beginning with: a) listing the problem, b) brainstorming about solutions, c) choosing a solution, d) thinking about ways to put the solutions into operations and checking the implemented changes (D'Zurilla & Goldfried, 1971).

To conclude, we distinguish three theoretical perspectives in the development and implementation of our worksite health promotion program. First of all, the two perspectives relating to the content of the intervention program: a) the work conditions, as important factors of the content and environment of the job, and b) the organizational risk factors, as important factors of organizational and management risks. In addition, for the implementation of the intervention program, a problem solving approach will be applied as a theoretical guideline for the implementation process of worksite health promotion interventions.

3.4 Practical implications for a problem solving approach in worksite health promotion programs

The following intervention phases may serve to illustrate the potential of a problem solving approach to worksite health promotion:

Phase 1: goal setting and shaping the process of change

(1) During the goal selection phase, a screening of all work conditions and organizational risk factors, in order to find the factors that require improvement within an organization. The screening will be done quantitative via questionnaires.

(2) All employees, from every department and function level in an organization, have to be involved in the screening. Bottom-up as well as top down processes are involved. The screening results are translated into goals at every level of the organization.

(3) In the goal setting phase of the program, it is important to explore the perceived costs/benefits of intervention targets, support from important others and the employees perceived competence to achieve the change goals.
(4) In the planning phase a problem solving intervention program is made. The goals that were set as a result of the screening represent the content of the program. The action plan must contain steps towards goal attainment. A support group is created to guide the implementation of the intervention program and to offer assistance to the board, the management and employees from this stage onwards, about what goes according to plan and what does not work well during the implementation of the intervention program.

Phase 2: feedback and process evaluation

(5) An intervention program should contain an inventory of the necessary interventions, barriers and challenges towards goal attainment and a guide with resources that are helpful to the attainment of the goals. Employees, managers and the support group should monitor themselves and their environment to find these barriers and resources. Barriers towards goal attainment can be found by exploring the employees' and managers' personal goals and checking whether these goals match those of the organisation. For this reason employees and managers should be encouraged to explore personal or intrinsic goals. These personal goals should be specific, important to the employees, not too easy or too difficult to carry out, and attainable in a restricted time frame. If the organizational goal and the employees' personal goal do not fit, the likelihood of action towards attainment of the organizational goal will be low. Some personal and/or organizational goals may have to be reformulated according to this problem solving perspective, to achieve a sufficient match between the goals of the organization and the employee.
(6) During the implementation of the intervention, managers and employees need to monitor their environment in order to list internal and external resources. Finding external resources entails asking for support from colleagues, managers, personal coaches or significant others. Employees are also encouraged to discuss, and learn interactive skills, that might help the employees to attain personal goals. Another motivational resource is the support group that monitors the implementation of the intervention program in the entire organization and encourages the employees with difficult tasks.
(7) A consequence of a problem solving intervention approach is the reformulation of goals from the intervention plan, when it appears that new barriers are not considered yet. It is important to inform the employees that if an intervention

goal is too difficult to attain, it is better to reformulate the goal in a more manageable way and teach the employees how to cope with relapse.

Phase 3: control procedures

(8) The managers should be assisted in building a specific action plan by asking when, where, and how employees will act in relation to a target or goal. An project group guides the organization in the process of change and can provide feedback.
(9) Employees and managers should be encouraged to use incentives during the implementation. Explore which incentives are most valued by the individuals or groups.
(10) Ask the employees to report and discuss the conflicting or competing goals that arise when striving to attain the set goals, and to try to align these with the organisational higher order goals.
(11) The support group controls whether the intervention is going according to the action plan.

Phase 4: evaluation and reformulate goals

(12) After the implementation, an evaluation takes place. The evaluation is performed by means of a second measurement. This measurement is quantitative and serves to evaluate whether initially set goals are reached and whether interventions have been effective in improving quality of work and health/well-being of employees. As a consequence of the evaluation, managers should feel free to reformulate a goal in a more manageable way. When goals are reformulated, a new cycle of the problem solving intervention program can be started.

Conclusion

In this chapter the argument has been made that, a theoretical framework that encompasses the content as well as the implementation of intervention programs is not only desirable, but necessary. For this purpose, various perspectives on quality of work and the process of development and implementation were considered and finally combined into a theoretical framework: work conditions, as important factors of the content and environment of the job, the organizational risk factors, as important factors of organizational and management risks, and a problem solving approach for implementing worksite health promotion intervention programs in health care. In the last section practical intervention principles derived from a problem solving approach were formulated to illustrate the potential of this perspective in implementing worksite health promotion programs in this setting.

In the next chapter we turn to the screening of quality of work and well-being of health care employees in order to set the intervention targets for a worksite health promotion program based on theoretical and methodological considerations that follow from chapter two, the review of the literature, and the problem solving approach that was described in this chapter.

CHAPTER 4

The Work Without Worry project: screening and intervention planning

4.1 Introduction

The implementation of a worksite health promotion program can be challenging, with consequences for the employees, management and in fact for the whole organization. In previous research, it was argumented that, given the prevalence and persistence of job stress in health care settings (Gelsema, et al., 2006; Geurts, Schaufeli & De Jonge, 1998; Paris & Hoge, 2009) and its influence on absence rates and personnel turnover, it is worthwhile to invest in worksite health promotion programs (WHPPs) on improving quality of work and well-being of health care employees (Van Wyk & Pillay-Van Wyk, 2010). In addition, according to the review in chapter 2, these programmes are preferably theory- and evidence-based. Moreover, one of the findings in the review was that using problem solving as an implementation approach, with the involvement of the management as well as the participation of the health care employees, contributes to a better implementation process and positive effects on quality of work and well-being of health care employees (Mikkelsen et al., 2000; LeBlanc et al., 2007). Consequently, (cost-)effective worksite health promotion programs with a theoretically based implementation framework have to be developed (Hamberg-van Reenen, Proper & van den Berg, 2012). In addition, research has shown that health care employees often report high job demands and suffer from job dissatisfaction, somatic complaints and psychological distress (Bolhuis et al., 2004; Bakker et al., 2003; Häusser et al., 2010; Van der Doef & Maes, 1999a). Therefore, this population was selected to study the effectiveness of WHPPs, targeting the components of the JDCS model and the Tripod model as content of the intervention and a problem solving approach as intervention method.

The relation between quality of work and well-being of health care employees has been studied in different settings and some results show that quality of work factors are predictive of well-being in health care employees (De Jonge et al., 1999). Moreover, the results of WHPPs on quality of work of health care employees show mainly positive effects on job demands and mixed results on job control and social support (Bourbonnais et al., 2006; LeBlanc, 2007; Lokk & Arnetz, 2000; Mikkelsen et al., 2000). In addition, the findings of the review (chapter 2) showed, that positive intervention effects were found for job satisfaction in studies that included problem solving techniques and a combination of a top down and bottom up implementation approach (Roberts, et al., 1976; Pryce et al., 2006; Innstrand et al., 2004). Psychological distress and emotional exhaustion were positively affected by WHPPs including a stress management training (Lee & Swanson Crockett, 1994; Gardner et al., 2005; Mikkelsen, et al., 2000; Innstrand, et al., 2004; Jones & Johnston, 2000; Delvaux et al., 2004; Van Dierendonck et al., 1998; Cohen-Katz et al., 2005). However, WHPP did not have a large effect on absenteeism and turnover (Brox and Frøystein, 2005; Van Dierendonck et al., 1998; Tveito & Eriksen, 2008). A reason

for not finding significant intervention effects in a lot of WHPPs on quality of work and well-being might be that the content of the intervention program should be extended with organizational risk factors (ORFs) besides work conditions (Akerboom & Maes, 2006). Furthermore, higher order goal facilitation could be an additional concept, because Ter Doest and her colleagues (2006) found a favorable influence on job satisfaction and work related outcomes of health care employees after taking into account the work conditions from the JDCS-model. An other reason might be, that a comprehensive framework for the implementation of WHPPs is missing in evaluation studies (Bourbonnais et al., 2006).

For the purpose of studying the effectiveness of a WHPP on quality of work and well-being, several perspectives on quality of work were discussed in chapter 3. Firstly, two theoretical perspectives making use of the influence of work conditions and organizational risk factors on well-being of health care employees, were applied for the content of the intervention program. The work conditions of the JDC(S) model (Karasek, 1979; Johnson & Hall, 1988; Johnson et al., 1989; Karasek & Theorell, 1990) and the organizational risk factors from the Tripod model (Wagenaar et al., 1990; Wagenaar et al., 1994) are complementing models in predicting well-being of employees. Secondly, for guiding the implementation process, a third theoretical framework was used. A problem solving perspective (D'Zurilla & Goldfried, 1971; D'Zurilla, Nezu, & Maydeu-Olivares, 2004) as a monitoring, goal directed, regulative, implementation approach – was introduced as an implementation framework. More specifically, including a phase of goal setting and attention to facilitation of higher order goals at work seem to be especially important in future WHPPs to improve quality of work and well-being of health care employees (Ter Doest et al., 2006; Pomaki, Maes & Ter Doest, 2004). Moreover, in relation to these perspectives, practical implications for the study of these problem solving intervention programs were presented.

Furthermore, the effectiveness of WHPPs in health care settings was reviewed in chapter 2 and the results suggest that there is a need for longitudinal intervention studies with quasi-experimental design to be more conclusive about the effectiveness of a WHPP in health care settings. Additionally, a suggestion was, that a distinction between the content and the implementation approach of the intervention program could provide more insight in the effects of the intervention program on quality of work factors and the influence of quality of work on well-being of health care employees.

For the first phase of the problem solving approach (D'Zurilla & Goldfried, 1971) – problem orientation, goal setting and shaping the process of change – a comprehensive screening was performed, examining work conditions (JDCS model), organizational risk factors (TRIPOD model), higher order goal facilitation and other

well-being outcomes among health care employees. During the second phase, an intervention plan was developed, based on the results of the screening. These two stages will be described in this chapter, while the next two phases of the problem solving approach, the implementation and evaluation of the worksite health promotion intervention program for improving quality of work and well-being among health care employees, will be the focus of the next chapter.

The screening was carried out in six health care centers for disabled persons in the Netherlands. High absence rates and high turnover levels among health care employees (7,3% absenteeism in contrast to 5,0% in the total Dutch population in 1998) indicated that efforts to improve quality of work and well-being through a worksite health promotion program could be worthwhile in this setting. The instrument used for the screening incorporated questionnaires assessing work conditions, ORFs, higher order goal facilitation and several wellness outcomes. The instrument included the Leiden Quality of Work Questionnaire (LQWQ; Van der Doef & Maes, 1999b), the Organizational Risk Factor Questionnaire (ORFQ; Akerboom, 1999), the Goal Facilitation Inventory (GFI-W; Maes et al., 2005; Ter Doest, Maes, Gebhardt & Koelewijn, (2006), the Dutch version of the Symptom Checklist (SCL-90; Arrindel & Ettema, 1986; Derogatis, 1983) and the Dutch version of the Maslach Burnout Inventory (MBI; Maslach, Jackson & Leiter, 1996; UBOS-C; Schaufeli & Dierendonck, 2000). For each health care center, the findings of the screening were compared to a reference group consisting of the other five health care centers. The thus determined pattern of unfavorable and favorable scores for each health care center formed the basis of the intervention targets and intervention programs for the three experimental/intervention centers (W1, W2 and W3). The intervention programs were created according to the steps of a problem solving perspective. The remaining three health care centers served as a control group (C1, C2 and C3).

Research Questions

The aim of this screening was firstly to identify problematic work conditions (skill discretion, decision authority, task control, work and time pressure, social support from supervisors, social support from co-workers, role ambiguity, physical exertion, hazardous exposure and job insecurity) and ORFs (staffing resources, communication, job skills, training opportunities and material resources) in six participating health care centers. Each health care center was compared to the other five care centers (the reference group) and it was examined whether significant differences between health care centers existed and which work conditions and ORFs would be target for interventions. It was expected that each health care center would have different results and different unfavorable work conditions and ORFs.

The second aim of this study was to advise the three experimental health care centers (W1, W2 and W3) on how they might improve unfavorable work conditions and ORFs and to generate an intervention program. Based on the screening results and the ensuing advice, the three experimental health care centers were encouraged to set intervention targets and make a long term intervention plan (two years). Moreover, the implementation of the intervention program was monitored, according to the practical implications of a problem solving approach, as described in chapter 3 and structured year plans. The control health care centers did not receive advice, nor did they set intervention targets and create intervention plans.

4.2 Method

Sample and Procedure

The intervention program of the "Work Without Worries" (WWW) project was based on a questionnaire survey, T1, among 1816 care employees of three experimental health care centers for disabled clients and 1737 employees of three comparable health care centers, that would serve as the control group. Within each organization, health care employees were stimulated to participate in the research project by their management team. The confidentiality of the data was guaranteed by Leiden University. All staff members of the participating care centers were invited to participate in the study. A list with the names and personal data was obtained from the HR-department. A personally addressed questionnaire accompanied by a cover letter from the university department was sent to the home address of each employee. The cover letter addressed items such as: privacy, the goal of the project and the deadline for returning the questionnaire. Two weeks before the deadline, all participants were reminded to return the questionnaire. Answering the questionnaire took about an hour. This procedure was followed for both the pre- and post- measurements, for the experimental as well as the control health care centers.

The structure of the project WWW is:

(1) A screening (T1) is done to investigate which factors needed improvement in order to increase quality of work, higher order goal facilitation, and well-being of employees. T-tests are performed to compare the results of the pre-test from each health care center to the five remaining health care centers, resulting in specific intervention targets for each center. After the screening, semi-structured interviews are held with a random sample of the employees from the three experimental health care centers. The aim of the interviews is a qualitative check of the quantitative results that are found in the pre-test.

(2) Based on the results of the T-tests, advice is given to the three experimental health care centers on which intervention goals could be selected and how they could enhance the quality of work of their employees.
(3) The next step for the management is to formulate an intervention plan, based on the screening and ensuing advice of the researchers.

The intervention project WWW has two objectives: a) to identify problematic quality of work factors of health care employees and b) to develop and implement interventions on an individual employee level and on an organizational level, that might lead to increased quality of work and well-being of health care employees. At the end of the intervention program an evaluation of the intervention program is performed on the basis of a second questionnaire survey (T2). The aim of the interventions is to provide an improvement in the work conditions and organizational risk factors and to develop lasting structures, working procedures, communication patterns and training facilities for the health care employees.

For the evaluation of the effects of the intervention, described in chapter 5, a quasi-experimental design with repeated measures is used. Three health care centers are selected as experimental groups, while three comparable health care centers serve as a control group. The screening results and the advice for improvement were based on a quantitative screening. On the basis of the screening results, an intervention program is made and implemented. In the experimental health care centers, where the interventions are implemented, different support groups are appointed to monitor the intervention process. Post-tests (T2) take place three years after T1, in order to measure effects on work conditions, organizational risk factors, higher order goal facilitation and well-being variables. After T2, the effects of the intervention are presented and discussed with the management of the health care centers.

Measures

The questionnaire assessed: a) socio demographic variables; b) work conditions, c) organizational risk factors, d) higher order goal facilitation, e) job satisfaction, and f) burnout and g) psychological distress and somatic complaints.

a) Socio-demographic variables

Data was collected for age, gender, years of employment, years working in health care, type of shift, and educational level.

b) Work conditions

The work conditions were assessed by the Leiden Quality of Work Questionnaire (LQWQ; Maes, Van der Doef & Verhoeven, 1993; Van der Doef & Maes, 1999b).

All items are phrased as statements with four answering categories (1=disagree completely, 2=disagree, 3=agree, and 4=agree completely). The factor structure of the questionnaire was assessed and cross-validated in two sub-samples of 2000 men and women from a large sample of the Dutch working population (Van der Doef & Maes, 1999b). Confirmatory factor analyses on a large sample of the Dutch population (N=10.112) indicated that the questionnaire measures eleven job conditions and the outcome variable of job satisfaction with a satisfactory reliability (Cronbach's alpha ranging from .73 to .93) (Van der Doef & Maes, 1999b). For the interpretation: a high score on a subscale is favorable for the subscales skill discretion, decision authority, task control, social support supervisor and co-workers. A low score is favorable for the subscales: work and time pressure, role ambiguity, physical exertion, hazardous exposure and job insecurity. The LQWQ assesses the three key concepts of the Karasek model; job demands, control, and social support with the following scales:

- Job demands are assessed by work and time pressure (α=.73; 4 items; e.g., "My job requires working very fast").
- Control is measured through decision authority (α=.74; 4 items; e.g., "I have a lot to say about what happens on my job"), skill discretion (α=.76; 8 items; e.g., "I get to do a variety of different things on my job") and task control (α=.73; 4 items; e.g., "I can determine my work pace")
- Social support is measured with the scales social support from supervisor (α=.89; 6 items; e.g., "My supervisor cares about our concerns") and social support from co-workers (α=.82; 6 items; e.g., "I feel appreciated by my colleagues")
- Physical exertion (α=.84; 3 items; e.g.: "My job requires lots of physical effort")
- Hazardous exposure (α=.93; 8 items; e.g.: "On my job I am exposed to dangerous tools, machinery or equipment")

Other work conditions included in this study were role ambiguity (α=.75; 6 items; e.g.: "I know exactly which are my tasks") and job insecurity (α=.75; 3 items: e.g.: "I expect to lose my job within the next five years"). Lack of meaningfulness was excluded in this study, as this scale had too little variance in this sample.

c) Organizational Risk Factors

The Organizational Risk Factors are measured with the Risk Factor Questionnaire (Akerboom, 1999), a tool consisting of 77 items, with three answer categories: Yes, No or Not applicable. For the interpretation counts that a low score on the subscales indicates a favorable situation. Half of the items were taken from the Tripod Delta Instrument. For the current study some of the items needed modification, in order

to make them more specific and relevant to the work of health care employees. The remaining items were extracted from the Tripod Accident Investigation method (Akerboom & Maes, 2006). Due to logistical problems during T1, the ORFs were not measured in one of the control health care centers. The five ORFs measured in this study are: staffing resources (α=.85; 22 items; e.g.:"Failure to fill vacancies?"), communication (α=.82; 12 items; e.g.:"Did you receive incomplete and/or incorrect information"), training opportunities (α=.77; 8 items; e.g.: "Did you have access to continued training and education"), job skills (α=.70; 5 items; e.g.:"Did you have the skills to carry out certain tasks?") and material resources (α=.74; 6 items; e.g. "Were device tools not always available when necessary?").

d) Higher Order Goal Facilitation

Higher order goal facilitation was measured with the workplace version of the goal facilitation inventory (GFI-W; Maes and Karoly, 2005; Ter Doest et al., 2006). The questionnaire consists of fifteen items representing work's facilitation of personal higher order goals (α=.93; e.g.: "Keeping up my self confidence", and "Receiving support from others"). Respondents answered the same question for each of 15 higher order goals: "To what extent can you achieve the following things through your work?". Answers were provided, separately for each goal, on a five-point scale (1= to a very limited extent; 5= to a very great extent).

e) Job Satisfaction

Job satisfaction was assessed with the job satisfaction scale of the LQWQ (α=.84; 6 items; e.g., "I am satisfied with my job"). Responses were given on a four-point rating scale, with higher scores indicating higher job satisfaction.

f) Somatic Complaints & Psychological Distress

Somatic complaints and psychological distress, a composite of anxiety and depression, and were assessed with the validated Dutch version of the Symptom Checklist (SCL-90; Arrindel & Ettema, 1986; Derogatis, 1983). This inventory measures the occurrence of psychological and physical complaints on a five points scale (1 = not at all, 5 = very much). Two subscales were used to measure psychological distress: anxiety (α=.88; 10 items; e.g. "Feeling afraid") and depressive complaints (α=.91; 16 items; e.g., "Feeling lethargic"). A mean score of these two subscales was calculated, because of high correlation between the two scales. Somatic complaints was the third subscale used from the SCL-90 (α=.83; 12 items; e.g., "Pain in the chest or heart region").

g) Burnout

Three burnout scales: emotional exhaustion, depersonalization, and personal competence were measured with the UBOS-C (Schaufeli & Dierendonck, 2000), a

validated Dutch version of the Maslach Burnout Inventory (MBI; Maslach et al., 1996) for health care employees. The UBOS-C consists of 22 statements, divided over three dimensions: emotional exhaustion (α=.76; 8 items; "I feel exhausted because of my work"), depersonalization (α=.86; 5 items; "I have the feeling that I treat some clients too impersonal") and personal competence (α=.77; 7 items; "I have accomplished many valuable things at my job"). Items were scored on seven-point rating scales ranging from '1=never' to '7=every day/always'.

4.3 Results of the screening

In this paragraph the results of the screening are presented in order to answer the first research question: 'Do the scores on the various work conditions, ORF, well-being outcomes and higher order goal facilitation in the three experimental health care centers differ from the reference group according to the results of the screening?'. First, the response rate will be presented, followed by a description of socio-demographic characteristics of the sample, and then the results concerning the work conditions, ORF, higher order goal facilitation, and well-being outcomes.

Response

Of the employees invited to participate, 45% returned the questionnaire at T1 (see table 4.1). In the intervention group the response rate at T1 was 55%, while in the control group the response rate was 35%. The response in the intervention group was significantly higher compared to the control group (chi-square: 81.65 (1), $p<.001$). Due to missing variables in the received questionnaires, there is a difference between the response at T1 (table 4.1) and the participation rates as presented in the data-analyses (table 4.2 and 4.3) of health care center W3 and C1.

Table 4.1 Response at T1 for the intervention group, the control group and the total sample.

	T1	
	Invited employees N	**Participation N (%)**
Intervention group	**1868**	**1034 (55)**
W1	690	368 (53)
W2	665	426 (64)
W3	513	240 (47)
Control group	**1812**	**639 (35)**
C1	475	215 (45)
C2	414	111 (27)
C3	923	313 (34)
Total	**3680**	**1673 (45)**

Socio-demographic data

The majority of the participants was female (80%) and 20% was male. Furthermore, 50% was younger than 35 years and 46% was between 36 years and 52 years old, only a small percentage (4%) older than 53 years. In addition, the largest group was married or living together with a partner (72%), 24% of the participants was single and the remaining group (4.5%) was divorced or widowed. More than half (56%) of the participants had worked for 0 to 5 years in the health care branch, almost a quarter (24%) worked 6 to 10 ten years in the branch, 17% between 11 and 20 years and 4% of the participants worked 21 years or longer in health care. Also almost half of all the participants (49%) had worked for 5 years or less in the current health care center, 24% worked there 5 to 10 years, 22% 11 to 20 years and 5% 21 years or longer. Regarding the amount of hours of work per week, the majority of the participants worked 25 or more (60%), 29% worked between 13 and 24 hours per week and 11% of the participants worked 12 hours or less. Moreover, 65% of the participants worked in changing shifts, and the remaining 35% in dayshifts. At last, most of the employees had a certificate for Vocational Education (VE; MBO in The Netherlands; 46%) or Higher Vocational Education (HVE; HBO in The Netherlands; 31%), a total of 13% had a general certificate of secondary education, 8% had secondary vocational education and a small percentage (2%) had an education at a university.

To summarize these results, the difference between the employees in the experimental health care centers and the control health centers on socio-demographic variables are: in health care center W1 employees are younger, unmarried, more experienced, lower educated and they work more hours per week, compared to the control group. In health care center W2 the employees are older, married, lower

educated, and less experienced. The employees of health care center W3 are older, more experienced and lower educated.

Work conditions and ORFs

Skewness has been calculated for all work conditions, ORFs and outcomes. From a statistical point of view (Morgan, Leech, Gloeckner & Barrett, 2004) in large samples as ours, the criterion for normality is a skewness that falls within a range of -1.0 to +1.0. All variables fall within this range. As a consequence the requirements for univariate and multivariate analyses are not violated.

For the description of the results concerning the work conditions and the ORF, a comparison is made between the scores per health care center and the scores of the reference group (the five other participating health care centers). Table 4.2a reveals that compared to this reference group, the employees of health care center W1 score significantly unfavorable on the work conditions 'hazardous exposure' and 'social support from supervisors'. The scores of the employees of health care center W2 are significantly more favorable on 'task control', 'work and time pressure', role ambiguity', 'physical exertion', 'hazardous exposure', 'job insecurity' and 'social support from supervisors' compared to the reference group. The employees of health care center W3 score significantly unfavorable on the work conditions 'skill discretion', 'decision authority', 'task control', 'work and time pressure' and 'physical exertion'.

Table 4.2a **Experimental health care centers**. Means and standard deviations of the screening. Each experimental health care center (W1, W2, W3) was compared to a reference group (five remaining health care centers, R1-R6) for the work conditions and the organizational risk factors. Significance levels after t-tests are reported.

Work conditions	**W1 (N=368) Mean (sd)**	**R1 (N=1298) Mean (sd)**	**T-test (df)**		**W2 (N=426) Mean (sd)**	**R2 (N=1240) Mean (sd)**	**T-test (df)**		**W3 (N=237) Mean (sd)**	**R3 (N=1429) Mean (sd)**	**T-test (df)**	
Skill Discretion	3.01 (.32)	2.99 (.38)	.64 (1664)	0	2.97 (.39)	3.01 (.36)	-1.88 (1664)	0	2.92 (.37)	3.01 (.36)	- 3.40** (1664)	--
Decision Authority	3.02 (.42)	2.97 (.45)	1.78 (1662)	0	3.00 (.41)	2.97 (.45)	1.28 (1662)	0	2.70 (.47)	3.03 (.42)	-10.80*** (1662)	---
Task control	2.65 (.46)	2.66 (.47)	-.09 (1663)	0	2.73 (.47)	2.63 (.47)	3.56*** (1663)	+++	2.42 (.49)	2.70 (.46)	-8.65*** (1663)	---
Work and Time pressure	2.72 (.53)	2.69 (.52)	1.14 (1651)	0	2.57 (.50)	2.74 (.52)	-5.72*** (1651)	+++	2.95 (.50)	2.65 (.51)	8.34*** (1651)	---
Role ambiguity	2.17 (.39)	2.13 (.40)	1.61 (1658)	0	2.11 (.38)	2.15 (.40)	-2.13* (1658)	+	2.12 (.39)	2.15 (.40)	-.77 (1658)	0
Physical exertion	2.61 (.77)	2.52 (.76)	1.85 (1659)	0	2.43 (.75)	2.58 (.76)	-3.65*** (1659)	+++	2.90 (.82)	2.48 (.73)	8.01*** (1659)	---
Hazardous exposure	1.92 (.48)	1.79 (.51)	4.13*** (1662)	---	1.72 (.49)	1.85 (.51)	-4.48*** (1662)	+++	1.80 (.51)	1.82 (.51)	-.58 (1662)	0
Job insecurity	1.84 (.56)	1.85 (.61)	- .36 (1653)	0	1.79 (.58)	1.87 (.61)	-2.43* (1653)	–	1.90 (.61)	1.84 (.60)	1.30 (1653)	0
Soc. Support supervisor	2.60 (.58)	2.88 (.52)	-8.83*** (1653)	---	2.92 (.49)	2.79 (.56)	4.30*** (1653)	+++	2.86 (.50)	2.81 (.55)	1.27 (1653)	0
Soc. Support co-workers	3.08 (.38)	3.09 (.39)	-.44 (1659)	0	3.08 (.37)	3.09 (.40)	-.57 (1659)	0	3.07 (.37)	3.09 (.39)	-.64 (1659)	0
Organizational Risk Factors[a]	**W1(N=225) Mean (sd)**	**R1 (N=990) Mean (sd)**	**T-test (df)**		**W2 (N=271) Mean (sd)**	**R2 (N=944) Mean (sd)**	**T-test (df)**		**W3 (N=209) Mean (sd)**	**R3 (N=1006) Mean (sd)**	**T-test (df)**	
Staffing resources	56.34 (24.21)	54.03 (25.84)	1.22 (1213)	0	41.55 (23.63)	58.16 (24.88)	-9.79*** (1213)	+++	63.90 (22.21)	52.49 (25.77)	5.96*** (1213)	---
Communication	47.67 (27.26)	33.08 (26.23)	7.48*** (1213)	---	26.41 (22.32)	38.48 (27.64)	-6.60*** (1213)	+++	31.67 (24.52)	36.64 (27.43)	-2.43* (1213)	+
Job Skills	35.56 (25.99)	28.26 (24.65)	3.97*** (1211)	---	22.02 (20.65)	31.80 (25.78)	-5.74*** (1211)	+++	31.03 (25.35)	29.32 (24.99)	.90 (1211)	0
Training opportunities	61.20 (31.76)	51.45 (32.90)	4.03*** (1202)	---	40.50 (28.04)	56.97 (33.29)	-7.42*** (1202)	+++	64.23 (29.99)	50.96 (33.03)	5.36*** (1202)	---
Material resources	50.27 (32.65)	32.25 (30.91)	7.79*** (1206)	---	30.13 (27.93)	37.17 (32.93)	-3.20*** (1206)	+++	30.37 (29.83)	36.68 (32.35)	-2.60* (1206)	+

*** p<.001; ** p<.01; * p<.05; +/ ++/ +++ = favorable result; 0 = non-significant result; -/ --/ --- = unfavorable result*

Table 4.2b **Control health care centers**. Means and standard deviations of the screening. Each control health care center (C1, C2 & C3) was compared to a reference group (five remaining health care centers, R1-R6) for the work conditions and the organizational risk factors. Significance levels after t-tests are reported.

Work conditions	**C1 (N=211) Mean (sd)**	**R4 (N=1455) Mean (sd)**	**T-test (df)**		**C2 (N=111) Mean (sd)**	**R5 (N=1555) Mean (sd)**	**T-test (df)**		**C3 (N=313) Mean (sd)**	**R6 (N=1353) Mean (sd)**	**T-test (df)**	
Skill Discretion	2.89 (.39)	3.01 (.36)	-4.57*** (1664)	---	3.17 (.33)	2.99 (.37)	5,16*** (1664)	+++	3.09 (.33)	2.98 (.37)	5,09*** (1664)	+++
Decision Authority	3.01 (.42)	2.98 (.44)	1,05 (1662)	0	3.10 (.40)	2.97 (.44)	2,86** (1662)	++	3.06 (.43)	2.97 (.44)	3,31** (1662)	++
Task control	2.73 (.44)	2.65 (.47)	2,48* (1663)	+	2.75 (.47)	2.64 (.47)	2,06* (1663)	+	2.66 (.44)	2.66 (.48)	,28 (1663)	0
Work and Time pressure	2.58 (.45)	2.71 (.53)	-3,54*** (1651)	+++	2.73 (.58)	2.69 (.52)	,74 (1651)	0	2.71 (.51)	2.69 (.52)	,33 (1651)	0
Role ambiguity	2.14 (.37)	2.14 (.40)	,10 (1658)	0	2.19 (.45)	2.14 (.39)	1,44 (1658)	0	2.15 (.42)	2.14 (.39)	,34 (1658)	0
Physical exertion	2.49 (.67)	2.56 (.77)	-1,05 (1659)	0	2.04 (.54)	2.58 (.76)	-7,31*** (1659)	+++	2.56 (.71)	2.54 (.77)	,55 (1659)	0
Hazardous exposure	1.75 (.46)	1.83 (.51)	-2,14* (1662)	+	1.84 (.55)	1.82 (.50)	,54 (1662)	0	1.89 (.54)	1.80 (.50)	2,61** (1662)	-
Job insecurity	1.85 (.60)	1.85 (.60)	,12 (1652)	0	1.73 (.61)	1.86 (.60)	-2,11* (1653)	+	1.95 (.65)	1.83 (.59)	3,37** (1653)	--
Soc. Support supervisor	2.90 (.52)	2.81 (.55)	-1,72 (1653)	0	2.81 (.44)	2.82 (.55)	-,20 (1653)	0	2.87 (.59)	2.81 (.53)	1,59 (1653)	0
Soc. Support co-workers	3.04 (.38)	3.09 (.39)	2,92** (1656)	--	3.08 (.46)	3.09 (.38)	-,26 (1659)	0	3.15 (.41)	3.07 (.38)	3,32** (1659)	--
Organizational Risk Factors[a]	**C1 (N=193) Mean (sd)**	**R4 (N=1022) Mean (sd)**	**T-test (df)**		**C2 Mean (sd)**	**R5 (N=1215) Mean (sd)**	**T-test (df)**		**C3 (N=317) Mean (sd)**	**C6 (N=898) Mean (sd)**	**T-test (df)**	
Staffing resources	46.99 (25.48)	55.87 (25.33)	-4,46*** (2013)	+++	na	54.46 (25.55)	na	na	62.47 (24.37)	51.63 (25.37)	6,61*** (1213)	---
Communication	29.49 (26.46)	36.97 (26.96)	-3,55*** (1213)	+++	na	35.78 (27.01)	na	na	41.91 (27.93)	33.62 (26.36)	4,74*** (1213)	---
Job Skills	24.31 (23.19)	30.60 (25.27)	-3,20** (1211)	++	na	29.61 (26.05)	na	na	34.14 (26.54)	28.01 (24.32)	3,77*** (1211)	---
Training opportunities	24.36 (34.05)	54.71 (32.49)	-3,58*** (1206)	+++	na	53.27 (32.90)	na	na	56.01 (34.19)	52.30 (32.40)	1,72 (1202)	0
Material resources	23.09 (27.87)	37.94 (32.20)	-5,97*** (1202)	+++	na	35.60 (32.00)	na	na	40.92 (33.70)	33.73 (31.19)	3,44** (1206)	--

**** p<.001; ** p<.01; * p<.05; +/ ++/ +++ = favorable result; 0 = non-significant result; -/ --/ --- = unfavorable result; na = not assessed.*

When examining the ORFs in health care center W1, significant unfavorable results are found for 'communication', 'job skills', 'training opportunities' and 'material resources'. The employees of health care center W2 reported significant favorable results on the ORFs 'staffing resources', 'communication', 'job skills', 'training opportunities' and 'material resources'. For health care center W3, significant unfavorable results are found for the ORFs 'staffing resources' and 'training opportunities'. Favorable differences are found for 'communication' and 'material resources'.

Table 4.2b reveals that the employees of health care center C1 score significantly unfavorable on the work conditions 'skill discretion' and 'social support from co-workers', compared to the reference group. Significant favorable results are found for the work conditions 'task control', 'work and time pressure' and 'hazardous exposure'. For health care center C2 significant favorable results are found for the work conditions 'skill discretion', 'decision authority', 'task control', 'physical exertion' and 'job insecurity'. In health care center C3 significant unfavorable results are found for 'hazardous exposure', 'job insecurity' and 'social support from co-workers'. In addition the employees score significantly favorable on the work conditions 'skill discretion' and 'decision authority'. Concerning the ORFs, the employees of health care center C1 score significantly favorable on all five ORFs compared to the reference group. Finally, the employees of health care center C3 score significantly unfavorable on all ORFs, except for 'training opportunities', which did not deviate from the reference group.

Outcome variables

Table 4.3a reveals that the employees of health care center W3 score significantly unfavorable on 'job satisfaction', 'emotional exhaustion' and 'depersonalization' compared to the reference group. Furthermore, the employees in health care center W2 reported significantly favorable results on 'emotional exhaustion' and 'depersonalization'. In addition, no significant differences were found in the three experimental health care centers on 'higher order goal facilitation', 'somatic complaints', 'psychological distress' and 'personal competence' compared to the reference group.

Table 4.3b shows that the employees of health care center C1 score significantly favorable on 'job satisfaction', 'higher order goal facilitation', 'emotional exhaustion' and 'depersonalization'. A significant unfavorable difference was found for 'depersonalization' in health care center C2 and significant favorable differences for 'depersonalization' and 'personal competence' for the employees of health care center C3, compared to the reference group.

Table 4.3a **Experimental health care centers.** T-test results of the screening. Each experimental health care center (W1, W2, & W3) was compared to a reference group (five remaining health care centers, R1-R6) for job satisfaction, higher order goal facilitation, somatic complaints, psychological distress and the three burnout scales. Significance levels are reported.

	W1 (N=225) Mean (sd)	R1 (N=990) Mean (sd)	T-test (df)		W2 (N=271) Mean (sd)	R2 (N=944) Mean (sd)	T-test (df)		W3 (N=209) Mean (sd)	R3 (N=1006) Mean (sd)	T-test (df)	
Job Satisfaction	2.85 (.52)	2.85 (.49)	.03 (1656)	0	2.88 (.47)	2.83 (.50)	1.74 (1656)	0	2.79 (.49)	2.86 (.49)	1.95* (1656)	-
Higher order goal facilitation	9.81 (1.68)	9.95 (1.92)	-1.45 (1490)	0	9.93 (1.77)	9.91 (1.90)	-.03 (1490)	0	9.77 (1.76)	9.94 (1.88)	-1.45 (1490)	0
Somatic complaints	17.04 (5.32)	16.53 (5.17)	1.58 (1663)	0	16.47 (4.85)	16.70 (5.32)	-.85 (1663)	0	17.20 (5.83)	16.55 (5.09)	1.76 (1663)	0
Psychological distress	18.45 (6.63)	17.89 (6.23)	1.73 (1661)	0	17.82 (5.88)	18.08 (6.47)	-1.13 (1661)	0	18.55 (7.15)	17.92 (6.17)	7.78 (1661)	0
Emotional Exhaustion	2.99 (1.03)	2.94 (.98)	1.01 (1665)	0	2.83 (.97)	2.99 (.99)	-2.85** (1665)	++	3.18 (.96)	2.91 (.99)	3.98*** (1665)	---
Depersonalization	2.08 (.75)	2.05 (.77)	.83 (1664)	0	1.95 (.72)	2.09 (.77)	-3.25** (1664)	++	2.18 (.83)	2.03 (.75)	2.85** (1664)	--
Personal Competence	5.03 (.62)	5.11 (.59)	-2.15 (1662)	0	5.11 (.58)	5.08 (.60)	.61 (1662)	0	5.02 (.55)	5.10 (.60)	-1.89 (1662)	0

*** p<.001; ** p<.01; * p<.05; +/ ++/ +++ = favorable result; 0 = non-significant result; -/ --/ --- = unfavorable result

Table 4.3b **Control health care centers**. T-test results of the screening. Each control health care center (C1, C2 & C3) was compared to a reference group (five remaining health care centers, R1-R6) for job satisfaction, higher order goal facilitation, somatic complaints, psychological distress and the three burnout scales. Significance levels are reported.

	C1 (N=211) Mean (sd)	R4 (N=1455) Mean (sd)	T-test (df)		C2 (N=111) Mean (sd)	R5 (N=1547) Mean (sd)	T-test (df)		C3 (N=309) Mean (sd)	R6 (N=1349) Mean (sd)	T-test (df)	
Job Satisfaction	2.94 (.50)	2.83 (49)	2.92** (1656)	++	2.78 (.52)	2.85 (.49)	-1.41(1656)	0	2.80 (.49)	2.86 (.50)	-1.76 (1656)	0
Higher order goal facilitation	10.29 (2.19)	9.88 (1.80)	2.98** (1490)	++	9.75 (1.96)	9.95 (1.85)	-1.11 (1490)	0	10.13 (2.02)	9.91 (1.84)	1.40 (1490)	0
Somatic complaints	16.20 (4.91)	16.71 (5.25)	-1.34 (1663)	0	15.90 (4.92)	16.71 (5.23)	-1.59 (1663)	0	16.61 (5.32)	16.66 (5.19)	-.16 (1663)	0
Psychological distress	38.20 (12.51)	39.91 (13.02)	-1.79 (1661)	0	39.07 (12.70)	39.74 (12.99)	-.53 (1661)	0	39.49 (12.82)	39.74 (13.01)	-.31 (1661)	0
Emotional Exhaustion	2.76 (.95)	2.98 (.99)	-3.01** (1665)	++	3.04 (1.05)	2.94 (.98)	1.00 (1665)	0	.97 (.95)	2.94 (1.00)	.45 (1665)	0
Depersonalization	1.94 (.69)	2.07 (.77)	-2.24* (1664)	+	2.52 (.83)	2.02 (.75)	6.79*** (1664)	---	1.97 (.73)	2.07 (.77)	-2.20* (1664)	+
Personal Competence	5.15 (.58)	5.08 (.60)	1.46 (1662)	0	5.01 (.65)	5.10 (.59	-1.43 (1662)	0	5.18 (.60)	5.07 (.59)	2.97** (1662)	++

*** p<.001; ** p<.01; * p<.05; +/ ++/ +++ = favorable result; 0 = non-significant result; -/ --/ --- = unfavorable result*

From the first phase of this study we can conclude that the quality of work and well-being of employees in health care center W1 and W3 are the least favorable. Health care center W1 scored unfavorable on the work conditions 'hazardous exposure' and 'social support from supervisors' and the ORF 'job skills', 'communication', 'training opportunities' and 'material resources'. In health care center W3 the work conditions 'skill discretion', 'decision authority', 'task control', 'work and time pressure' and 'physical exertion' and the ORF 'staffing resources' and 'training opportunities' have to be improved. These improvements are expected to positively influence well-being outcomes 'emotional exhaustion' and 'depersonalization' in health care center W3. In addition, health care center W2 scored most favorable in the screening and it is therefore important that the favorable results on quality of work and well-being are maintained and quality of work determinants that scored average need to be improved. The work conditions that scored average in W2 are 'skill discretion', 'decision authority' and 'social support from co-workers'. With regards to the well-being outcomes, the three experimental health care centers did not show significant differences on 'somatic complaints' and 'psychological distress' compared to the reference group. Higher order goal facilitation did not differ between the experimental health care centers either. More attention to facilitation of higher order goals is needed in the three health care centers, because working in an environment in which higher order goals are set by the management and staff members and are not directed at facilitating the care employees, is expected to lead to problems in quality of work and well-being of employees. Moreover, a great deal of organizational change is expected when, besides paying attention to the well-being of the clients/patients of the organization, it is important to be attentive to the quality of work and well-being among the staff and care employees too. This intervention goal was a recommendation exposed by the screening phase of this study and will be described in the next section.

4.4 Diagnosis and advice for the problem solving intervention programs in three experimental health care centers

The findings of the pre-test provided the researchers with information on the problematic factors in the three experimental health care centers. In the next section is described how these results lead to a phase of goal setting and intervention planning. Moreover, the specific intervention goals and intervention plans are described to give insight in to how intervention targets are selected and intervention plans are created according to a problem solving perspective.

The problem solving approach started with the selection of the intervention goals, obtained from the screening procedure at T1. As the screening instrument is based on the JDCS model, extended with an organizational perspective, these models formed the theoretical base for the intervention. However, only aspects that were

identified as problematic were targeted by the intervention. Based on this screening, problems were identified and specific interventions were selected by the personnel. This top down and bottom-up procedure took about one year before the intervention program started. The following intervention goals were selected for the experimental health care centers: 1) to develop an effective organizational structure, to improve commitment and internal processes and create protocols and procedures for specific work tasks, 2) to increase openness between management and health care employees, and 3) to develop a "coaching" leadership style, in order to improve communication between employees and managers. Furthermore, it was agreed that the management team as well as health care employees would participate in a training program to improve their personal and job-related skills, while coaching sessions improved cooperation and leadership skills of the managers as well as the organizational structure.

In each of the experimental health care settings, three different teams were responsible for the implementation process of the intervention program. Firstly, a support group, consisting of a human resources manager and a division staff member, evaluated the intervention process twice a month. Information of these meetings was reported to the second group in the implementation process, the steering group, which evaluated the process in all divisions of the health care center once a month. This committee included the members of the support group, together with a representative of the employee board, a member of the executive board and an external researcher. The chairman of the steering group reported the progress to the supervision committee, which consisted of an external advisor, supervising the whole project, the president of the executive board and the members of the steering group. This supervision committee met 5 to 6 times a year, evaluating the intervention process by means of controlling the action plan, giving feedback to the members of the steering and support groups and making adjustments to the intervention plan to be sure that conflicting or unrealistic goals were reformulated. The control group did not receive any intervention or supervision; the management only received the results of T1.

The researchers presented the results of the screening for each health care center to the boards and in a later phase to the staff and care employees of health care centers W1, W2 and W3. First, of all the health care centers received specific advice on how they could improve the content of the work at their health care center, by motivating them to improve the work conditions and ORFs that came out unfavourably at the screening. Second, other, more process related recommendations were given to all three health centers. After the advice was given, the board and staff were encouraged to set a number of intervention goals. Subsequently, they were motivated to create intervention plans, based on the intervention goals. The three intervention programs that were developed for the different health care centers were tailor-made, and the

implementation – by various committees – was supported by the board of executives. Here, it is important to mention that although the actual content of the intervention targets differed in each health care center, the process of intervention planning and implementation was according to a problem solving approach in all three health centers. The planning went according to the following problem solving phases: a) list the problem, b) brainstorm about solutions, c) choose a solution, d) think about ways to put the solutions into operations and check implementation (D'Zurilla & Nezu, 1982). In the next section a description is given of the intervention goals and the intervention programs of the three experimental health care centers, according to the proposed recommendations of the researchers and the projected intervention targets. In the review of chapter 2 was concluded that worksite health promotion programs including a problem solving approach, with bottom-up as well as a top down processes, and a focus on either the personal level or the organizational level, are effective in improving quality of work and well-being of health care employees (LeBlanc et al., 2007; Lokk & Arnetz, 2000; Innstrand et al., 2004; Mikkelsen et al., 2000 and Pryce et al., 2006). Therefore, the proposed intervention programs are structured according to these intervention characteristics.

Health Care Center W1

Compared to the reference group, the participants from health care center W1 scored average on most of the work conditions (see table 4.2a). and on the ORF 'staffing resources', meaning no intervention was needed on these aspects. However, health care center W1 scored unfavorably on the work conditions 'social support from supervisor' and 'hazardous exposure' and the ORF 'communication', 'job skills', 'training opportunities' and 'material resources' when compared with the reference group. Subsequently, the intervention target for health care center W1 was to improve on those aspects that had scored unfavorably at T1. Based on these targets the intervention plan of health a care center W1 was as follows:

1. To increase the ORF 'communication' as a main target, to create an effective organizational structure rather than an "island" structure, interventions were directed at improving a cooperative organizational climate. This climate should ensure that communication is professional, secure and accurate:
    - Consult supervisors interactively by means of structural company conferences with the management team. The development of the organizational policy, including the bottlenecks of the policy, should be a shared effort. Coaching can be seen as the instrument to unite and connect the different levels of the organization but also as an instrument to direct the process.

- The introduction of a support group, consisting of a change specialist, creative, motivated employees, and the input of the facilities' staff members who back up the support process from their own function.
- Let an evaluation of the policy take place on a quarterly basis in all consultation structures with combined feedback in the company meetings. An external advisor should be appointed to manage the change process.

2. To increase social 'support from supervisor', interventions were directed at improving leadership, coaching and communication by improving the qualities and capacities of managers and executives and improving the communication between executives and staff, as well as that of staff amongst each other. Use coaching as a leadership style and steering instrument:
   - Train managers and executives in coaching skills (in terms of a deeper understanding of their staff) and in communication skills (in terms of more contact and exchange and better feedback with colleagues and staff).
   - Learn to consult with the entire team in the workplace, with the supervisor steering/coaching towards the organizational – and unit goals – without being overpowering; with the supervisor playing a supporting role where necessary, and the supervisor making personal goals open to discussion and relating them to the organizational and unit goals.
   - Unity of leadership from director to team leader, in which the supervisors also receive support and the facilities of the management team members.

3. To decrease 'hazardous exposure' and increase 'job skills', 'material resources' and 'training opportunities', the competencies of the care staff and managers regarding the supporting tasks of inhabitants and staff members needed to be enhanced, by teaching professional and specifically skilled staff members to set priorities and manage time efficiently, through coaching efforts of the supervisor and an (individual) (re)training program:
   - The role and tasks of the team co-ordinator will have to be carefully formulated, in consultation with the staff members concerned.
   - For better understanding and consultation between the disciplines concerned ('living' and 'specific care' units), managers and staff members, supervised by the support group where necessary, need to propose a more effective policy.
   - A result-focused development of function and task descriptions, in order to test current executives and staff members by means of job assessments. Based on this, individual (re)trainings programs can be developed.

Health Care Center W2

Health care center W2 scored favorably compared to the reference group on the work conditions 'task control', 'work and time pressure', 'role ambiguity', 'physical exertion', 'hazardous exposure' 'job insecurity' and 'social support from supervisor', as well as the ORF 'staffing resources', 'communication', 'job skills', 'material resources' and 'training opportunities' at T1. For the work conditions 'skill discretion', 'decision authority', and 'social support from co-workers', health care center W2 scored average when compared with the reference group. Health care center W2 did not have an unfaverable score on any of the work conditions or ORFs. Therefore, the intervention target for health care center W2 was to improve the work conditions that scored average compared to the reference group. This intervention target formed the basis of the intervention plan of health care center W2:

1. To improve 'skill discretion', 'decision authority' and 'support co-workers', a more effective organizational structure was created regarding the care- and supervision tasks by means of more support-oriented than care-oriented services of managers via staff members to clients:
    - Location managers and coordinating supervisors to formulate, in team consultations with staff members, the goals to achieve in learning how to set priorities in care and support.
    - Management and sector managers to coordinate the organizational structure more carefully with the goals of the health care centers.
    - Monthly attuning and possible readjustments between sector and location managers.

2. To improve the work condition 'skill discretion' and leadership capacities by further developing the qualities and coaching skills of the executives in a tailor-made training program:
    - Formulation of personal development plans by sector and location managers.
    - Learn to set priorities regarding management tasks.

3. To enhance social -and communication skills of staff members in order to improve 'support from co-workers' by means of a training program in which staff members and executives learn to improve communication with one another in terms of more and better feedback and effective communication:
    - Introduce a directional commission as support team for the educational program and the change process within the organization.

- Introduce teambuilding sessions with the location manager, team leader, and staff.
- Training of psychosocial skills.
- Training in handling aggression of inhabitants.

Health Care Center W3

Health care center W3 did not deviate form the reference group on the work conditions 'role ambiguity', 'hazardous exposure', 'job insecurity' and 'social support from supervisor and co-workers' as well as the ORF 'job skills'. Compared with the reference group, health care center W3 scored favorably on the ORF 'communication' and 'material resources'. Unfavorable scores were found on the work conditions 'skill discretion', 'decision authority', 'task control', 'work and time pressure' and 'physical exertion' and the ORF 'staffing resources' and 'training opportunities'. Thus, the intervention target of health care center W3 was to improve on these aspects that scored unfavorably at T1. According to these targets the intervention plan of health a care center W3 was as follows:

1. To improve 'work and time pressure', 'decision authority' and 'task control', a more effective decentralised organizational structure is introduced by means of well recognisable locations and their teams with coordinating supervisors and location managers with decentralised authority:
   - Replacement of existing functions of sector and location managers and coordinating supervisors through assessment programs.
   - Management Teams and sector managers to attune organizational policy with goals of locations and look after a better placement and planning of (new) staff members.
   - Introduce a new consultation structure and monthly attuning and possible readjustment between sector – and location managers.

2. To improve leadership capacities and communication by means of a retraining program in which, for example, coaching skills and social skills will be trained in terms of more and better feedback and effective communication:
   - Sector and location managers should pay a lot of attention to aspects such as 'training opportunities for staff', 'decision authority', 'task control', 'work and time pressure' and 'physical exertion'.
   - Assess current and new executives regarding their management capacities and offer recommendations for a retraining program.
   - Formulation of a personal development plan by sector and location managers.

3. To improve 'training opportunities' and moreover, the educational level of staff, by the introduction of a tailor-made retraining program:
    - Introduce teambuilding with location manager, team leader, and team.
    - Offer care employees a basic course and a personal development plan.
    - Introduction of a care manager (with supervisory, as well as care duties) and an assistant manager (caring duties).
    - Provide training in psychosocial skills for staff.
    - Provide tailor-made courses, e.g. handling aggression of patients.

4. To improve 'staffing resources' by solving the problem of structural understaffing.

4.5 Conclusions and discussion

In this section the conclusions regarding the results of the screening and intervention planning project will be summarized and the findings will be discussed. The work conditions and ORF that needed to be improved in the three health care centers vary significantly from each other. Given the amount of job factors and outcome measures within the organizations that needed improvement, it was concluded that health care centers W1 and W3 required the greatest improvement. Because the health care centers varied on the factors that needed improvement, the goals and intervention plans also differed from each other. Moreover, the scores of the experimental health care centers were compared to a reference group and therefore intervention targets could be carefully selected in each health care center. Due to this goal-oriented approach it is expected that the organizations showed improvement at T2 on the unfavorable work conditions and ORFs, and improvements in these aspects will reflect itself in improved higher order goal facilitation and well-being outcomes. More specifically, most improvement in well-being outcomes might be expected in W3, because this health care center scored least favorable on quality of work and well-being outcomes. The improvements on well-being outcomes in W1 and W2 might be smaller compared to W3, because the well-being of employees in W1 and W2 is already on an acceptable level. Therefore, maintaining the current level of well-being in W1 and W2 should also be an acceptable and positive intervention outcome.

Because of the cross-sectional design of the study, the results can pinpoint current problems within the health care centers and can differentiate between different health care centers on quality of work and well-being factors. Further longitudinal study will be needed to verify the results and the effectiveness of problem solving intervention programs. Additionally, another strength of this study is the screenings instrument. The findings confirm that the questionnaire 'You and your work', was able to differentiate between the health care centers. However, the present study also has it limitations. The response of the control group was significantly (Chi-square = 81.65 (1); p-value < 0.000) lower than the response in the

experimental health care centers. A possible explanation might be that the managers from the control group were less motivated to encourage their employees to fill in the questionnaires, than the managers of the employees who knew they would participate in an intervention, because the management teams were told in advance, whether there organization was in the control group or the experimental group. This situation might have created a selection bias in the results of the screening. Because the participating employees in the control group might be more motivated and committed towards their work than the non-participating employees, they might be more positive about their work environment and feel healthier, which might create a positive selection bias on quality of work and well-being in the control group. This means that positive, non-significant differences between the experimental group and the reference group could in fact be significant. Additionally, negative, significant differences could in fact be smaller or non-significant. A second limitation concerns the difference between the experimental health care centers on socio demographic variables. This has implications for the generalizability of the results of the screening, which means that the results on well-being and quality of work can be biased. Another critical issue is the way we set the intervention goals. We suggested that a comparison between the results of each health care center with the reference group would show problematic organizational aspects for the health care centers. However, it can be argued that a significant difference in scores does not automatically implicate that there is a real problem on that specific organizational aspect. Another method to indicate problematic organizational factors is to compare with an external norm group to determine intervention targets. Such a norm group was available for a comparison on the work conditions, burnout, somatic complaints, psychological distress and job satisfaction and a preliminary comparison showed the same findings as to the reference group. But for the ORFs and higher order goal facilitation there was no norm group available and therefore we applied the current equation, while this comparison shows that there are improvements feasible for the employees in these health care centers.

The next stages, according to the problem solving approach, in the WWW project were to implement the intervention plans, and evaluate whether the experimental health care centers reached their intervention targets. By means of a post measurement (T2), three years after T1, an effect evaluation was conducted to examine whether the problematic factors found in the screening were improved and whether well-being of the employees improved. The implementation of the interventions and the effect evaluation are presented in the next chapter.

CHAPTER 5

The Work Without Worry project: evaluation of a problem solving intervention program among health care employees

5.1 Introduction

Worksite health promotion interventions to improve quality of work for health care employees can have important consequences for employees personally and the organizational structure. Application of these interventions are often challenging barriers for health care employees. In particular, employees working in health care centers for mentally disabled clients experience higher levels of burnout and less job satisfaction in comparison to other health care settings (Geurts et al., 1998; Paris & Hoge, 2009). To improve these health care employees' quality of work and eventually their well-being, the application of a theoretically based intervention program, containing work conditions and organizational aspects is expected to be more effective (Van der Doef, 2000; Akerboom & Maes, 2006). One of the most influential models in occupational functioning, the Job Demand Control Support (JDCS) model, has concentrated on the impact of work conditions such as job demands, control, and social support on employees' physical and psychological health (Johnson & Hall, 1988; Johnson et al., 1989; Karasek, 1979; 1985; Barnett & Brennan, 1995; De Jonge, Mulder, & Nijhuis, 1999; Johnson et al., 1995). Additionally, researchers examined the elimination of organizational risk factors as a primary strategy in order to prevent negative outcomes in an organization (Wagenaar et al., 1994). Besides the components for the content of an intervention program, the implementation approach appears to be of importance (Bourbonnais et al., 2006). A problem solving approach is investigated to gain insight into the implementation process in worksite health promotion programs directed at quality of work in health care organizations and well-being of health care employees. In a prior study, higher order goal facilitation through work of health care employees appears to have a positive influence on employee job satisfaction and well-being outcomes (Ter Doest et al., 2006).

In early worksite health promotion interventions, the focus was primarily on the physical safety of the employee (Maes & Van der Doef, 2004), followed by programs focusing on improvement of the health of employees by training them in individual stress management skills and promoting physical exercise. Upon this shift of focus from illness prevention to health promotion, the influence of working conditions on the health and well-being status of employees was acknowledged in worksite health promotion (Van der Doef & Maes, 1999a; Häusser et al., 2010). This resulted in worksite health promotion interventions focusing on improving quality of work. The most recent worksite intervention programs offer a combination of educational, organizational and environmental activities designed to enhance quality of work. However, these programs have not been performed in health care settings yet. A number of intervention studies among health care employees, including studies applying the well known JDCS model, have been executed, but the effects of the intervention programs differ a lot (Bourbonnais et al., 2006; LeBlanc et al., 2007;

Lokk & Arnetz, 2000; Mikkelsen et al., 2000; Petterson & Arnetz, 1998; Petterson, Donnersvard, Lagerstrom, & Toomingas, 2006; Tveito & Eriksen, 2008), despite the connection between work conditions and well-being outcomes (Van der Doef, 1999a; 2000, De Rijk, Le Blanc, Schaufeli, & De Jonge, 1998; Bakker et al., 2005; Demerouti et al., 2001; Johnson et al., 1995). This lack of consistency between intervention studies may be explained by the absence of a comprehensive theoretical framework to improve quality of work of health care employees. There appears to be no definitive answer as to what works, how and why. Additionally, the philosophy of just trying everything that is available in terms of intervention methods – 'the more the better' – is not supported by empirical evidence (Petterson & Arnetz, 1998; Petterson et al., 2006). A theoretically based intervention approach, focusing on the work characteristics of the JDCS model and the Tripod model, is expected to direct the intervention program. Moreover, to involve all employees of a health care center, the intervention approach has to be top down as well as bottom up. Besides the top-down/bottom-up issue, the intervention approach requires an individually and organizationally directed method, to involve all employees with different job roles in an organization. In order to understand the process of improving quality of work and well-being of health care employees, we suggest that a dynamic, problem solving intervention approach should be taken into account (Leventhal & Mora, 2005; D'Zurilla & Goldfried, 1971; Locke & Latham, 2002). A problem solving approach focuses on the goal directed and monitoring aspects of human behavior. Explanations for action are sought not in static personal tendencies, but rather in dynamic problem solving techniques like monitoring, feedback, control processes and (re)formulating goals. As such, a problem solving approach tends to involve employees into the intervention process and thus allows for the attainment of personal higher order goals, which might have a positive influence on their well-being (Ter Doest et al., 2006; Pomaki et al., 2004).

Work conditions

As mentioned earlier, the importance of the JDCS model in occupational research on employees' well-being is well-known. In this model, a combination of job demands and control results in high strain jobs (high demands and low control) or low strain jobs (low demands and high control), and to active (high demands and high control) or passive jobs (low demands and low control) (Karasek, 1979; Van der Doef & Maes, 1998). The social support dimension results in isolated (with little opportunities for social interaction) or cooperative jobs (where interaction with colleagues is integrated) (Johnson, 1989; Karasek & Theorell, 1990; Van der Doef, 2000). A high strain job is hypothesized to result in high risk of psychological and physical illness, while active jobs are seen as precursors for increased motivation and learning. Van der Doef &

Maes (1998, 1999a) tested two hypotheses – the iso-strain hypothesis and the buffer hypothesis. The iso-strain hypothesis states that demands, control, and social support predict strain, while the buffer hypothesis posits that control and social support buffer the negative effects of demands on health. Research on these two hypotheses have found support for both arguments, and suggest that high demands are not unhealthy per se, because increased job control, in terms of decision authority and skill discretion, and social support at the workplace can moderate the impact of high demands on employees' well-being (Johnson & Hall, 1988; Van der Doef & Maes, 1998; Bakker et al., 2005; Bakker, Demerouti, de Boer & Schaufeli, 2003; Bakker, Demerouti, & Verbeke, 2004; Demerouti, Bakker, Nachreiner & Schaufeli, 2001; Johnson, et al., 1995; Daniels & Guppy, 1994; Barnett & Brennan, 1997).

Theorell (1996) states that the most important aspect between the three components is a balance: i.e. if demands increase, then control and/or social support should also increase to prevent a negative effect. Job demands, control and social support are important job conditions to take into account, when trying to increase job satisfaction and employee well-being. Van der Doef (2000) suggested also that other work factors, such as job insecurity and role ambiguity, are both important predictors of employees` health and well-being. Boya et al. (2007) confirmed this finding for job insecurity and Pomaki et al. (2007) for role ambiguity. A common critique on the JDCS model is, that only a few aspects of the work environment are being examined and the JDCS model does not assign importance to the organizational context in which work tasks take place (Parker, et al., 2001).

Organizational risk factors

Although research examining the effects of organizational characteristics for health and well-being of care providers is limited (Akerboom & Maes, 2006), in addition to work conditions, a focus on the content of worksite health promotion intervention programs, organizational risk factors (e.g.: training possibilities and communication) have been known to promote not only health and well-being of employees, but also improved organizational performance (Jaffe, et al., 1995; Shoaf et al., 2004). Organizational characteristics considered in the current intervention project are derived from the Tripod accident causation model (Wagenaar et al., 1990; Wagenaar et al., 1994), in which contributing causes of accidents are traced back to 'systemic errors' in the way the organization functions. Barling and Zacharatos (2004) and Shoaf et al. (2004) suggest that determinants of organizational performance are likely to affect organizational safety and will affect employee health and well-being as well. Different studies based on the Tripod model have led to similar conclusions, suggesting that it is relevant to take organizational risk factors (ORFs) (e.g. training opportunities and communication) into account when constructing worksite intervention programs

(Schabracq, 2003; Frese & Zapf, 1994; Semmer et al., 1995). The Tripod model classifies deficiencies in working conditions, also known as latent failures, into eleven categories of inadequate organizational functioning. Five of the eleven failure types (staffing resources, communication, job skills, training opportunities and material resources) identified in the Tripod Delta predicted improved outcome measures like job satisfaction, emotional exhaustion, psychological distress and somatic complaints, next to the work conditions of the JDCS model (Akerboom & Maes, 2006). Apparently, two of these five organizational risk factors, communication and training opportunities, were of central importance to job satisfaction of the health care employees.

Despite these findings, the integration of organizational risk factors in intervention studies is limited (Gelsema et al., 2006). In addition, a sound theoretical framework to guide the development and implementation process of worksite interventions to improve quality of work and well-being appears to be missing. As we suggested earlier, a problem solving intervention approach may serve as a reliable method.

A problem solving intervention approach on quality of work and well-being

Intervention programs are often implemented by means of top-down processes (Brox & Frøystein, 2005; Cohen-Katz et al., 2005; Van Dierendonck et al., 1998; Gardner et al., 2005; Kuske et al., 2009; Tveito & Eriksen 2008), where the management specifies the problems within an organization and sets the goals for an intervention program to change the organizational structure, the employee´s behavior or both. In a problem solving approach, which gained attention in psychological theory (Locke & Latham, 2002; D'Zurilla & Goldfried, 1971; D'Zurilla et al., 2004; Watson & Tharp, 2006; Bandura, 1989; Emmons, 1986, 1989, 1997), not only the management but also the employees are involved in the intervention process. In this study, top down as well as bottom up processes are both taken into account (Petterson & Arnetz, 1998; Petterson et al., 2006; Lavoie et al., 2005; Bourbonnais et al., 2006). This problem solving approach is accomplished in regulative steps. After the problem orientation phase, the intervention targets have to be set by both the employees and the staff members. Therefore all employees participate in a quantitative screening procedure, including questionnaires about work conditions, organizational risk factors, and well-being outcomes. With the results of this screening process, the intervention goals are being set in an action plan and implemented in the organization together with a support team consisting of care employees and a human resource manager. During the implementation of the intervention program, the employees are involved in the process by feedback mechanisms, process evaluation and problem solving.

Prior research on a problem solving approach shows positive intervention effects at the workplace on social support and group coherence (Arneson & Ekberg, 2005; Mikkelsen et al., 2000), job demands (LeBlanc et al., 2007; Lokk & Arnetz, 2000; Mikkelsen et al., 2000), job satisfaction (Roberts et al., 1976), work related stress and role harmony (Mikkelsen et al., 2000). Besides these intervention effects, research on goal setting has demonstrated that both perceived characteristics of work-related goals (e.g., level of difficulty, congruence between individual and organizational goals) and other cognitions about work-related goals (e.g., commitment, goal-related self-efficacy) are related to a wide range of employee outcomes, including performance, satisfaction and well-being (see reviews by Locke & Latham, 1990, 2002). In that view, a problem solving approach, starting with a stage of goal setting, can thus be seen as a interesting intervention method for the health care organization to change problematic work conditions and organizational risk factors and to facilitate the attainment of higher order goals of their employees.

For that reason next to well-known positive and negative work related outcomes such as job satisfaction, emotional exhaustion, depersonalization and personal competence, it is also important to measure the degree to which important higher order goals can be facilitated by their work. In the current study we chose to evaluate the intervention effect on higher order goal facilitation through work of health care employees. It should be noted that these goals are indeed higher order goals or in other words important life goals. As such, these goals differ from work related goals. Furthermore, with respect to worksite health promotion, research in employee samples demonstrates links between personal higher order goal facilitation, work conditions and employee well-being. Pomaki et al. (2004) found that higher order goal facilitation was significantly related to Karasek's work conditions and positively predicted employee well-being. In addition, Hyvönen, Feldt, Tolvanen & Kinnunen (2010) and Hyvönen et al. (2009) suggested that psychosocial work components contribute to the content of personal work goals, which also function as mediators, between the work environment and employee well-being. Likewise, Ter Doest et al. (2006) found that higher order goal facilitation through work accounted for substantial variance in job satisfaction and well-being outcomes even after controlling for the work conditions from Karasek's model (1979; Karasek & Theorell, 1990). However, although the predictive value of higher order goal facilitation on well-being of employees has been reported in several studies, so far these associations have not been evaluated longitudinally or in worksite interventions.

In a problem solving intervention program in health care organizations, the management team as well as the employees assume a pro-active behavior rather than a passive role in the intervention program within the health care organization and,

based on the evidence of self-efficacy and self-determination (Locke & Latham, 2002; Gochman, 1997), obliges personal involvement and bottom-up processes more than ever. A problem solving approach can be identified as a goal guidance process which is part of organizational change and the attainment of personal and/or organizational goals. The most frequently examined change and maintenance mechanisms of a problem solving intervention program, include: 1) goal setting, 2) planning, 3) feedback mechanisms & control processes, and 4) progress evaluation.

Only a few evaluation studies are known that examined the effects of a problem solving intervention program at the workplace. Mikkelsen and his colleagues (2000) investigated the effects of a participatory intervention in health care settings in Norway on employees job demands, control, work stress and job satisfaction. They found that this type of organizational interventions can have long-terms effects on problem solving and employees satisfaction. LeBlanc and her colleagues (2007) studied the effectiveness of a team-based burnout intervention program for oncology care providers with a participatory action research approach and results showed positive effects on emotional exhaustion and depersonalization for the intervention group. Most worksite intervention studies focus on the effects of work conditions and ORFs on job satisfaction and health outcomes. The current study includes higher order goal facilitation as an important outcome of a problem solving intervention approach. The phases of the problem solving approach based on goal setting (Locke & Latham, 2002), self-regulation theory (according to Maes & Karoly, 2005) and problem solving (D'Zurilla & Goldfried, 1971) outline the structure of the theoretical framework used for the construction and implementation of the intervention project in the participating health care facilities in this study. Based on the results of the pre-test (T1), intervention goals were set by employees and management and problem solving techniques such as feedback, monitoring, control processes and reformulation of goals, were used to create and implement intervention programs for the experimental health care facilities.

Research questions

This study among health care employees aims to evaluate the effects of a problem solving approach to worksite health promotion and focuses on two research questions. Firstly, it is examined whether work conditions (skill discretion, decision authority, task control, work and time pressure, social support supervisor and co-workers, role ambiguity and job insecurity) and organizational risk factors (training opportunities and communication) improved after the intervention, compared to a control group. Secondly, it is investigated whether well-being outcomes (job satisfaction, higher order goal facilitation, emotional exhaustion, depersonalization and personal competence) of health care employees also improved significantly after the intervention. We

expected that a problem solving approach to work site health promotion programs would improve work conditions, organizational risk factors and well-being outcomes of health care employees. In the effect evaluation, we controlled for socio-demographic variables, such as kind of shift, years in sector and educational level. The need to control for these socio-demographic variables, when conducting research with health care employees, was confirmed by the differences that were found in the screening of the experimental and control health care centers on socio-demographic variables (see Appendix I). We did not control for the number of years in the health care center because this socio-demographic variable is highly correlated to years in the sector.

5.2 Method

Sample and procedure

In this study data was collected among health care employees in six health care centers for disabled people. At T1 3680 staff members of six health care centers were invited to participate and three experimental centers and three control centers were selected. On an at random base, the three experimental and three control health care centers were allocated to the experimental or the control group based on size and type of care, in order to create comparable groups. Out of this number, 1673 employees (45.5%) filled in the questionnaire. At T2 (three years after T1) 1466 of the 3626 staff members participated, which results in a response rate of 40.4%. Of the participants from T1 707 completed the questionnaire on the T2 (42.6%). Due to high turnover levels, about 15-20 % of the participants of the original sample could not be invited for T2.

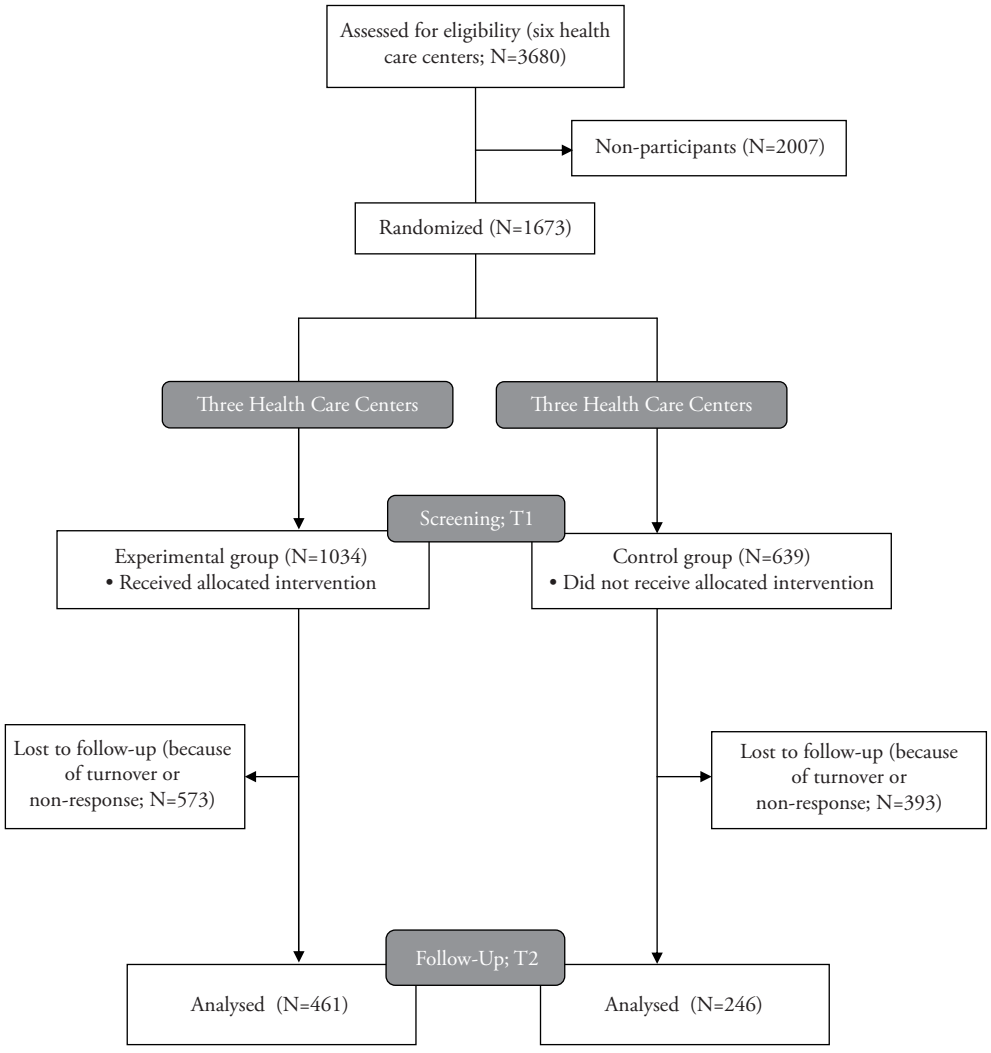
The measurement procedure at T2 was the same as at T1 for the experimental health care centers (N=461) as well as the control group (N=246). Participation was on a voluntary basis and questionnaire identification codes were used. Only the researchers had access to the key relating the codes to individual employees. Furthermore, confidentiality of personal information was guaranteed. The measurements included the completion of a questionnaire.

The analyses in this chapter are based on the data of the 707 respondents, who completed the entire questionnaire at T1 and T2. We used one-tailed analyses instead of the two-tailed because the hypotheses are formulated in a specific direction.

Skewness has been calculated for all work conditions, ORFs and outcomes. From a traditional point of view (Morgan et al., 2004) in large samples as ours the criterion for normality is a skewness that falls within a range of -1.0 to +1.0. All variables fall within this range. As a consequence the requirements for univariate and multivariate analyses are not violated.

The majority of the sample is female (80.2%) and married or living together (4.3%). Most of the participants are in the age groups of 18 to 35 years old (42.1%) and 36 to 52 years old (53.7%). 31.3% of the participants were half-time employed (working 0 to 24 hours per week) and 59% worked 25 or more hours. Nearly half of the participants worked 0 to 5 years in this sector (48.9%) and 41.6% worked 0 to 5 years in this sector.

Figure 5.1. Flow chart



Intervention

The intervention program applying a problem solving approach and extensively described in Chapter 4, started with the selection of the intervention goals, obtained from the screening procedure at T1. A support group, a steering group and a supervision group evaluated the intervention process on a regular base. The monitoring of the intervention programs was done by the steering and the support group, to be sure that conflicting or unrealistic goals could reformulated. The control group did not receive any intervention or supervision; the management only received the results of T1.

Measures

The respondents filled in a questionnaire which assessed: a) socio demographic variables, b) work conditions, c) organizational risk factors, d) facilitation of higher order goals, e) job satisfaction, and f) burnout.

a) Socio-demographic variables

Socio-demographic variables for this study are age, gender, kind of shift, years of employment, years working in this sector and educational level. The experimental group and control group were compared to each other on these variables and based on these results (see Appendix I) kind of shift, years working in this sector and educational level were included in this study as control variables.

b) Work conditions

The work conditions were assessed by the Leiden Quality of Work Questionnaire (LQWQ; Maes & Karoly, 2005; Van der Doef & Maes, 1999b). All items are phrased as statements with four answering categories (1=disagree completely, 2=disagree, 3=agree, and 4=agree completely). The factor structure of the questionnaire was assessed and cross-validated in two sub-samples of 2000 men and women from a large sample of the Dutch working population (Van der Doef & Maes, 1999b). Confirmatory factor analyses on a large sample of the Dutch population (N=10.112) indicated that the questionnaire measures eleven job conditions and the outcome variable of job satisfaction with a satisfactory reliability (Crohnbach's alpha ranging from .73 to .93) (van der Doef & Maes, 1999b). For the interpretation: a high score on a subscale is positive for the subscales skill discretion, decision authority, task control, social support supervisor and co-workers. A low score is positive for the subscales: work and time pressure, role ambiguity, physical exertion, hazardous exposure and job insecurity. The LQWQ assesses the three key concepts of the Karasek model; job demands, control, and social support with the following scales:

- Job demands are assessed by work and time pressure (α=.73; 4 items; e.g., "My job requires working very fast").
- Control is measured through decision authority (α=.74; 4 items; e.g., "I have a lot to say about what happens on my job"), skill discretion (α=.76; 8 items; e.g., "I get to do a variety of different things on my job") and task control (α=.73; 4 items; e.g., "I can determine my work pace")
- Social support is measured with the scales social support from supervisor (α=.89; 6 items; e.g., "My supervisor cares about our concerns") and social support from co-workers (α=.82; 6 items; e.g., "I feel appreciated by my colleagues")

Other work conditions included in this study were role ambiguity (α=.75; 6 items; e.g.: "I know exactly which are my tasks") and job insecurity (α=.75; 3 items: e.g.: "I expect to lose my job within the next five years").

c) Organizational Risk Factors

The Organizational Risk Factors are measured with the Risk Factor Questionnaire, a tool consisting of 77 items, with three answer categories: Yes, No or Not applicable. For the interpretation counts that a low score on the subscales is positive. Half of the items were taken from the Tripod Delta Instrument. For the current study some of the items needed modification, in order to make them more specific and relevant to the work of health care employees. The remaining items were extracted from the Tripod Accident Investigation method (Akerboom & Maes, 2006). The two ORFs measured in this study are: communication (α=.82; 12 items; e.g.:"Did you receive incomplete and/or incorrect information"), and training opportunities (α=.77; 8 items; e.g.: "Did you have access to continued training and education").

d) Higher Order Goal Facilitation

Higher order goal facilitation was measured with the workplace version of the goal facilitation inventory (GFI-W; Maes et al., 2005). The questionnaire consists of fifteen items representing work's facilitation of higher order goals (α=.93; e.g.: "Keeping up my self confidence", and "Receiving support from others"). Respondents answered the same question for each of 15 higher order goals: "To what extent can you achieve the following things through your work?". Answers were provided, separately for each goal, on a five-point scale (1= to a very limited extent; 5= to a very great extent).

e) Job Satisfaction

Job satisfaction was assessed with the job satisfaction scale of the LQWQ (α=.84; 6 items; e.g., "I am satisfied with my job"). Responses were given on a four-point rating scale, with higher scores indicating higher job satisfaction.

f) Burnout

Three burnout scales: emotional exhaustion, depersonalization and personal competence were measured with the UBOS-C (Schaufeli & Dierendonck, 2000), a validated Dutch version of the Maslach Burnout Inventory (MBI; Maslach et al., 1996) for health care employees. The UBOS-C consists of 22 statements, divided over three burnout dimensions: emotional exhaustion (α=.76; 8 items; "I feel exhausted because of my work"), depersonalization 5 items; (α=.86; 5 items; "I have the feeling that I treat some clients too impersonal") and personal competence (α=.77; 7 items; "I have accomplished many valuable things at my job"). Items were scored on seven-point rating scales ranging from '1=never' to '7=every day/always'.

Data analyses

The analyses were conducted with the SPSS 15.0 program. Mancovas and ancovas were used to compare the experimental health care centers to the control group. It was analyzed to which extent work conditions, organizational risk factors, job satisfaction, facilitation of higher order goals and the burnout dimensions emotional exhaustion, depersonalization and personal competence changed significantly between T1 and T2 (one-tailed test).

The representativeness of the employee sample at T2 (selective dropout) was analyzed by comparing the data (socio-demographic variables, work conditions, organizational risk factors and well-being outcomes) from the employees that completed the questionnaire at T1 but not at T2 (N=977) to the data from the employees that completed the questionnaire at T1 as well as T2 (N=707). Chi-square tests and t-tests were used to perform the analyses. The socio demographic variables (gender, age, marital status, years in sector, years in health care center, work hours per week, kind of shift and highest educational level) of the employees of the experimental group (N=461) and the control group (N=246) were compared at T1. Chi-square tests were used to perform the analyses.

5.3 Results

Representativity of the sample

The research sample that participated at both T1 and T2 (N=707; research group) was not representative compared to sample that participated only at T1 (N=977;

drop-out group) for several variables (see Appendix II). In the research group the employees were older (higher percentage in age group 36-52 years; 53.7% vs. 40.0%) and a higher percentage was married (74.3% vs. 69.5%) than in the drop-out group. Furthermore, more employees in the research group worked as care staff (34.2% vs. 25.2%) and more employees worked 6-10 years, thus a longer period of time, in the current sector (27.0% vs. 21.0%) and current health care center (27.2% vs. 21.9%). The employees from the research group worked more hours per week (work more often 13 to 24 hours per week; 31.1% vs. 26.7%) and more day shifts (40.0% vs. 31.7%) compared to the drop-out group. Concerning the work conditions, the employees in the research group experienced more decision authority (mean: 3.03 vs. 2.95) and more social support from their supervisor (mean: 2.86 vs. 2.79) and they had higher scores on the well-being outcomes higher order goal facilitation (mean: 10.02 vs. 9.89), job satisfaction (mean: 2.90 vs. 2.81) and personal competence (mean: 5.12 vs. 5.07).

Socio-demographics

In terms of the demographic aspects of the sample that participated at T1 and T2, several significant differences on the socio-demographic variables between the control group and the experimental group were found (see Appendix I). In the experimental group more employees work 6-10 years, thus a longer period of time, in the current sector (29.1% vs. 23.3%) and the current health care center (29.7% vs. 22.4%). Furthermore, in the experimental health care centers employees were lower educated (secondary vocational: 47.1% vs. 37.8%;) and work more flexible shifts (63.3% vs. 52.0%) than in the control group. On the basis of these findings 'kind of shift', 'years in sector' and 'educational level' were included in the analyses as control variables.

Multivariate and univariate effects of the variables in the study

Pearson correlations are used to test the univariate relationships between the variables in this study (table 5.1a and 5.1b). The correlations between the scales indicate that the relation between most factors are moderate to weak ($r<.5$). This is in line with previous correlation studies including quality of work and well-being (Van der Doef & Maes, 1999a; Akerboom & Maes, 2006) and shows that the different scales measure separate concepts. Means and standard deviation for the variables used in the analyses are displayed in tables 5.2, and 5.3. In addition, table 5.2 presents the results of the multivariate and univariate analyses.

Table 5.1a Intercorrelations between work conditions, ORFs en well-being outcomes within T1 (N=1684).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Skill Discretion (1)	1													
Decision Authority (2)	.356***	1												
Task control (3)	.123***	.429***	1											
Time and work pressure (4)	.201***	-.131***	-.334***	1										
Role ambiguity (5)	-.139***	-.316***	-.227***	.107***	1									
Job insecurity (6)	-.111***	-.247***	-.061*	-.034	.324***	1								
Social sup. from supervisor (7)	.197***	.268***	.207***	-.174***	-.426***	-.211***	1							
Social sup. from coworkers (8)	.228***	.201***	.108***	-.041	-.342***	-.179***	.309***	1						
Communication (9)	.129***	-.004	.011	.259***	.281***	.125***	-.256***	-.194***	1					
Training Opportunities (10)	-.117***	-.115**	-.163***	.111**	.197***	.067*	-.254***	-.098**	.256***	1				
Job satisfaction (11)	.286***	.319***	.255***	-.230***	-.396***	-.245***	.370***	.321***	-.257***	-.248***	1			
Higher order goal fac. (12)	.183***	.251***	.226***	-.149***	-.310***	-.156***	.309***	.245***	-.169***	-.201***	.360***	1		
Emotional Exhaustion (13)	-.024	-.242***	-.275***	.388***	.283***	.088***	-.253***	-.196***	.256***	.159***	-.499***	-.319***	1	
Depersonalization (14)	-.080**	-.211***	-.116***	.126***	.286***	.126***	-.214***	-.180***	.228***	.094**	-.367***	-.267***	.516***	1
Personal competence (15)	.322***	.231***	.089***	.014	-.237***	-.178***	.174***	.227***	-.048	-.132***	.324***	.314***	-.295***	-.401***

*** p<.001; ** p<.01; * p<.05; (*two-tailed)*

Table 5.1b. Intercorrelations between work conditions, ORFs en well-being outcomes within T2 (N=1460).

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Skill Discretion (1)	1													
Decision Authority (2)	.408***	1												
Task control (3)	.141***	.404***	1											
Time and work pressure (4)	.206***	-.109***	-.242***	1										
Role ambiguity (5)	-.179***	-.330***	-.260***	.090**	1									
Job insecurity (6)	-.153***	-.190***	-.0287	-.069**	.263***	1								
Social sup from supervisor (7)	.231***	.290***	.197***	-.144***	-.391***	-.144***	1							
Social sup from co-workers (8)	.233***	.263***	.078**	-.037	-.368***	-.230***	.314***	1						
Communication (9)	.112***	-.084**	-.06*	.222***	.320***	.104***	-.285***	-.157***	1					
Training Opportunities (10)	-.220***	-.108***	-.074**	.068*	.185***	.078**	-.298***	-.112***	.214***	1				
Job satisfaction (11)	.336***	.374***	.243***	-.171***	-.382***	-.246***	.383***	.370***	-.257***	-.236***	1			
Higher order goal fac. (12)	.175***	.212***	.159***	-.083**	-.292***	-.134***	.253***	.222***	-.193***	-.155***	.309***	1		
Emotional Exhaustion (13)	-.024	-.167***	-.139***	.334***	.252***	.113***	-.220***	-.168***	.307***	.109***	-.448***	-.272***	1	
Depersonalization (14)	.364***	.232***	.079**	.050	-.231***	-.139***	.161***	.206***	.003	-.162***	.281***	.316***	-.206***	1
Personal competence (15)	-.137***	-.192***	-.059*	.069**	.248***	.152***	-.198***	-.170***	.249***	.128***	-.323***	-.204***	.496***	-.334***

*** p<.001; ** p<.01; * p<.05; (*two-tailed)*

Initially, in answer to the first research question, whether the work conditions and ORFs significantly improved after the intervention, the analyses show a significant multivariate effect on the dependent variables (work conditions and ORFs) among the experimental and the control group between T1 and T2 ($p < .05$, one-tailed). Univariate analyses demonstrate significantly positive effects for the work conditions skill discretion, decision authority and job insecurity and for the organizational risk factor training opportunities. However, a significant negative effect was found for the organizational risk factor communication.

Table 5.3 shows the effects between the experimental group and the control group on the well-being outcome variables between T1 and T2. Here, in answer to the second question whether the well-being of health care employees improved after the intervention compared to the control group, no significant multivariate main effect was found for the four outcome variables. Education was found to be a significant covariate. Furthermore, with univariate ancovas, no significant main effects were found. Education was a significant covariate for emotional exhaustion and education and kind of shift were significant covariates for personal competence.

Table 5.2. Experimental group vs. control group. Work conditions and organizational risk factors: averages on pre-test and adjusted means for post-test and results. Mancova and Ancova effects between the experimental and control group (F and p-values). Positive (+), negative (-) or non-significant (0) intervention effect at post-test. Correction for pre-test, years in sector, kind of shift, and educational level. Employees participated in both T1 and T2.

		Experimental group (N=461)		Control Group (N=246)		F-value	Sign.	p-value	Effect
		Mean	Sd.	Mean	Sd.		covariate	1-tailed	+ / - / 0
MANCOVA						5,511		,000***	
ANCOVA									
Work and Time	T1	2.70	.50	2.64	.48	1.135	Education*	.287	0
Pressure	T2	2.69	.50	2.64	.51				
	T2 adj	2.69	.02	2.65	.03				
Skill Discretion	T1	3.00	.37	3.04	.39	4.236	Education****	.040*	+
	T2	3.02	.36	3.01	.36				
	T2 adj	3.03	.01	2.99	.02				
Decision	T1	2.98	.46	3.11	.43	7.333		.007**	++
Authority	T2	3.04	.45	3.04	.39				
	T2 adj	3.07	.02	2.71	.02				
Task control	T1	2.63	.47	2.76	.41	1.615		.204	0
	T2	2.72	.44	2.77	.41				
	T2 adj	2.75	.02	2.71	.02				
Soc. Support	T1	2.85	.51	2.87	.52	.381	Years in	.537	0
Supervisor	T2	2.78	.55	2.82	.51		Sector*		
	T2 adj	2.79	.02	2.81	.03		Kind of shift*		
Soc. Support	T1	3.10	.34	3.11	.40	.195	Kind of shift***	.659	0
Co-Workers	T2	3.04	.36	3.05	.36				
	T2 adj	3.04	.02	2.81	.03				
Role ambiguity	T1	2.12	.37	2.13	.38	.662	Years in	.416	0
	T2	2.16	.36	2.19	.38		Sector**		
	T2 adj	2.16	.02	2.18	.02				
Job insecurity	T1	1.76	.54	1.82	.61	17.529		.000***	+++
	T2	1.71	.46	1.89	.57				
	T2 adj	1.72	.02	1.88	.03				
Communication	T1	36.32	27.02	35.54	27.24	9.767		.002**	--
	T2	40.98	26.76	39.04	28.00				
	T2 adj	43.26	1.33	36.42	1.70				
Training	T1	53.10	31.11	48.90	34.84	14.442		.000***	+++
Opportunities	T2	38.06	31.09	47.29	32.79				
	T2 adj	35.03	1.70	45.88	2.25				

**p<.10, **p<.05, *** p<.01, **** p<.001, + = significant favorable intervention effect, - = significant unfavorable intervention effect, 0 = no significant intervention effect.*

Table 5.3 Experimental vs. control group. Outcomes: Averages of pre-test and adjusted means of post-test and results. Mancova and ancova effects between the experimental and control group (F and p-values). Positive (+), negative (-) or non-significant (0) intervention effect at post-test. Correction for pre-test, years in sector, kind of shift, and educational level. Employees participated in both T1 and T2.

		Experimental group (N=461)		Control Group (N=246)		F-value	Sign. covariate	p-value 1-tailed	Effect
		Mean	Sd.	Mean	Sd.				+ / - / 0
MANCOVA						.483	Education	.789	0
ANCOVA									
Job-	T1	2.91	.46	2.89	.43	.015		.902	0
Satisfaction	T2	2.86	.46	2.85	.46				
	T2 adj	2.86	.02	2.85	.03				
Higher Order	T1	9.48	1.58	9.81	1.79	.959		.328	0
Goal	T2	9.97	1.84	10.13	1.81				
facilitation	T2 adj	9.99	.08	10.13	.11				
Emotional	T1	2.88	.95	2.81	.88	.328	Education	.567	0
Exhaustion	T2	2.86	.92	2.81	.88				
	T2 adj	2.85	.03	2.82	.05				
Depersonalization	T1	2.06	.76	2.03	.74	.246		.620	0
	T2	1.97	.71	1.97	.71				
	T2 adj	1.97	.03	1.99	.04				
Personal	T1	5.10	.58	5.17	.61	.001	Kind of Shift*	.973	0
Competence	T2	5.14	.63	5.17	.68		Education**		
	T2 adj	5.15	.03	5.15	.04				

**p<.05, ** p<.01, , + = significant positive effect, - = significant negative effect, 0 = non significant effect.*

5.4 Discussion

The current study evaluates whether a problem solving approach to a worksite health promotion program among health care employees is effective in improving work conditions, organizational risk factors and well-being outcomes in health care employees. In line with our expectations, the first research question was partly supported. For the health care employees in the experimental group the work conditions skill discretion, decision authority and job insecurity and the organizational risk factor training opportunities, significantly improved after the intervention program, compared to the control group.

Apparently, these findings suggest that interventions with a problem solving approach lead to increased opportunity for health care employees to acquire better job skills obtained by the intervention program. Moreover, there is a beneficial effect on perceptions of the control and job security. We might conclude that the new

organizational structure in the experimental health care centers with more procedures at the one hand and more openness and a coaching leadership style at the other hand improved the quality of work of the health care employees. In contrast, according to the results, communication was affected negatively in the experimental health care centers, compared to the control group. According to Akerboom & Maes (2006), communication is important to improve job satisfaction of health care employees. A possible explanation can be that at the start of the interventions, the focus was more on improving the procedures in the organizations and less on the social skills. Later on, when the training program started, the respondents became more aware that the new organizational structure required an increased communication between all levels of the organization. In any case, more research is needed to clarify the role of communication in work site health promotion interventions.

Several previous intervention studies attempted to change work conditions and organizational risk factors by means of top-down interventions (Brox & Frøystein, 2005; Katz-Cohen et al., 2005; Van Dierendonck et al., 1998; Gardner et al., 2005; Kuske et al., 2009; Tveito & Eriksen, 2008). Communication procedures and decision making about the intervention program were given only by the management of the health care organization. In the current study, a top-down as well as a bottom-up intervention approach was used, according to a problem solving approach. Because health care employees are more focused in giving care to their clients than giving information about work processes to their colleges and supervisors, it might take more time to improve the communication skills of the health care employees. Moreover, making decisions (which has improved already by the interventions) about which information has to be given and to whom might take more time and training of all health care employees in making clear procedures and require more social skills to improve the quality of the working environment.

The results do not support the second research question: well-being outcomes did not significantly improve at T2 in the experimental health care centers, compared to the control group. No effects were found on job satisfaction, higher order goal facilitation, emotional exhaustion, depersonalization and personal competence. This means that, although there were favorable effects on various work conditions (skill discretion, decision authority and job insecurity) and an organizational factor (training opportunities), these effects are not reflected in an increase in job satisfaction and well-being. Various explanations can be provided for these results.

First of all, besides some beneficial effects on working conditions, a negative effect was found with regard to communication. As communication seems to be an important variable in this setting (Van Dierendonck et al., 1998; Kuske et al., 2009; Lee & Swanson Crockett, 1994), it is possible that this partly explains e.g the job satisfaction, the lack of effect on well-being outcomes.

Still apart from this, it is quite possible that statistically significant changes in predictors in relatively large populations are not sufficiently strong to cause desired effects on well-being outcomes.

Independent of these explanations, a third explanation may be the content of the intervention program. Because two of the activities of the program were more organizationally based and especially focused on division level of the participating health care centers, the individual focus was only in the personal training program for the care employees, while this training started later. In addition, it is likely that other (unknown) factors, have influenced the well-being of the health care employees during the intervention period, this is a common limitation in evaluation studies that are not done in an experimental setting, but in a real life setting (Pryce et al., 2006; Lokk & Arnetz, 2000; Petterson et al., 2006; Bourbonnais et al., 2006). Furthermore, well-being of employees is influenced by more than just quality of work factors, that were not included in the current study. For example ergonomical problems, support at home, budget cutting in health care organizations are also known factors that influence well-being of employees. Moreover this training program did not yet end at the evaluation moment (T2). Therefore it is possible that job satisfaction, higher order goal facilitation and burnout levels did not yet improve. Consequently, a third measurement moment one or two years after T2 could provide more insight in potential long term effects.

Limitations and practical implications

The present study has some limitations. A common bias in longitudinal research concerns the healthy worker effect: unhealthy workers are more likely to have quit their jobs at the second measure moment, hence the healthy workers are overrepresented in the sample of workers that responds at both times. The sample group at T2 was only representative for some of the socio demographic, dependent and independent variables (see Appendix II). In the research group the employees were older, worked more hours per week and worked a longer period in the sector than in the drop-out group. Besides, more employees in the research group worked as care staff, than in the drop out group and they experienced more decision authority, more social support from their supervisor, more higher order goal facilitation, more job satisfaction and more personal competence.

In addition, the experimental group and the control group also differ from each other on socio-demographic variables (for specific results see Appendix I). In the experimental group more employees work a longer period of time in the current sector and in the current health care center. Furthermore, in the experimental health care centers employees were lower educated and they work more flexible shifts than in the control group. In short we can conclude that the health care employees of

the experimental health care centers have more experience in their job, are more committed to their job and can profit more from a training intervention. This has implications for the generalizability of the results of this study, which means that the results can be biased in a more positive direction for the experimental health care centers.

Furthermore, the sample in this study consisted of employees working in health care centers for disabled people. These employees are mostly lower educated (mainly secondary vocational and lower; see Appendix I) than for example health care employees working in general hospitals (more college and university educated) in the Netherlands. It would be interesting to investigate, whether the effects, found in this study, correspond to the effects in a sample with health care employees of a general hospital, who may react very differently to a problem solving intervention approach.

Implications for future research concern study design and intervention conditions. First, our study had a two wave panel design with a time interval of three years, where the actual implementation of the intervention program for the care employees started just one year after T1. The choice of a time interval should be based on a structured intervention perspective, in which problematic goals have to be set and how the effects of work conditions changes and higher order goal facilitation on well-being outcomes evolves over time. Therefore, it is suggested that future studies explore the influence of changes in multiple waves with different time intervals, so that the time process underlying the mutual influence of work conditions and different well-being outcomes is further clarified.

Secondly, we found that a problem solving intervention approach significantly improves work conditions and training facilities of employees. However, there is no firm evidence that this top down/bottom up intervention is more effective, especially in terms of well-being outcomes than e.g. a top down approach. It is therefore suggested to compare different approaches in future research, implying that there should be different intervention conditions, next to the control condition.

CHAPTER 6

Do changes in work conditions and higher order goal facilitation affect well-being among health care employees?

6.1 Introduction

Numerous studies have been conducted to determine which, and to which extent, work conditions affect well-being among health care employees. Insight into the impact of work conditions and work processes is important as it can give directions for improvement of workplaces and jobs as a means to improve the well-being of this often highly committed working population. For instance the job demand-control-support model (Karasek, 1979; Karasek & Theorell, 1990) identifies specific job characteristics (e.g. job demands, skill discretion, social support from supervisor) as key sources of influence on (health care) employee well-being outcomes (Van der Doef & Maes, 1998, 1999a; Häusser et al., 2010; De Lange, Taris, Kompier, Houtman & Bongers, 2003). While the majority of health care employees seems to adjust to regular changes in health care centers like increased job demands caused by e.g. understaffing, absence rates in health care centers are still higher than the national Dutch mean (CBS statline, 2011). Other known adverse consequences are reduced job satisfaction, psychological and somatic complaints and burnout (Van der Doef, 2000; Gelsema et al., 2006).

One of the most influential occupational stress models focusing on the impact of the psychosocial work environment on employees' well-being is the Job Demand-Control-Support- (JDCS) model (Karasek, 1979; Johnson et al., 1989). According to this model, well-being outcomes of employees are negatively influenced by high job demands, while job control and social support have a positive influence on employee well-being outcomes. Van der Doef (2000) found that lack of job control and social support are positively associated with burnout and psychological distress of health care employees. On the other hand, when trying to increase job satisfaction and employee well-being by improving work conditions, job control and social support are important work conditions to take into account. One of the common criticisms on the JDCS-model is its simplicity, as it includes only a few dimensions of the work situation (Kristensen, 1995). Other work stressors, such as role ambiguity and job insecurity have also been suggested to affect well-being outcomes (Van der Doef & Maes, 1999a; Rosse & Rosse, 1981; Pomaki et al., 2007) and job insecurity (Chen, Chen, Tsai & Lo, 2007; Boya et al., 2007; Andrea et al., 2009).

Next to the influence of work conditions on well-being among health care employees, higher order goal facilitation at work also seems to affect job satisfaction and well-being outcomes (Ter Doest et al., 2006). Moreover, the pursuit and attainment of higher order goals within and outside the work environment is related to subjective well-being (Emmons, 1996; Ter Doest et al., 2006). While the relation between work conditions and well-being outcomes in health care employees has been explored before (Van der Doef and Maes, 1999a; Häusser et al., 2010), there are thus

far no longitudinal studies on the influence of changes in higher order goal facilitation and well-being outcomes in health care employees (Ter Doest et al., 2006).

Higher order goal facilitation at work may also explain variance in employee well-being. Higher order goal facilitation at work (like learning new things, supporting others, obtaining more self-esteem) usually refers to desired states rather than to concrete endpoints. As a consequence, they are often impossible to achieve directly or permanently, but can e.g. be achieved by more specific, subordinate work goals. From this perspective important higher order goals can be facilitated by the way, the workplace is organized. Existing research illustrates a link between higher order goal facilitation at work, work conditions and employee well-being. Pomaki et al. (2004) found that higher order goal facilitation was significantly related to Karasek's work conditions and positively predicted employee well-being. Furthermore, higher order goal facilitation at work seems to be positively related to several well-being outcomes among health care employees (Ter Doest et al., 2006). In this cross-sectional study, higher order goal facilitation at work was positively related to job satisfaction and personal competence and negatively to emotional exhaustion and psychological distress of health care employees, independent of demographics and work conditions of the JDCS model. In addition, Hyvönen et al., (2010) and Hyvönen et al. (2009) suggested that psychosocial work components contribute to the achievement of personal work goals, which function as a mediator, between the work environment and employee well-being. These recent studies confirmed the importance of higher order goal facilitation beside work conditions as predictors for employee well-being. To further improve intervention research Van der Doef (2000) recommended to focus on changes in work conditions and higher order goal facilitation, to demonstrate that these predictors are beneficial for well-being of health care employees in the long run.

With respect to changes in work conditions and well-being among health care employees, several studies suggest that job satisfaction and burnout are important outcome variables in relation to either learning on the job (Taris, Kompier, de Lange, Schaufeli & Schreurs, 2003) or turnover (Geurts et al., 1998). Some longitudinal studies showed that changes in work conditions are predictive of well-being outcomes in health care employees (Gelsema et al., 2006; Bourbonnais et al., 2006) and other occupational groups (Barnett & Brennan, 1997; Schaufeli, Bakker & Van Rhenen, 2009). In the current study, besides job satisfaction and burnout, two general well-being outcomes are included: psychological distress and somatic complaints. A longitudinal study, in which independent and dependent variables are measured at all times (a complete panel design), can better control the influence of changes in the work environment on well-being of health care employees. A longitudinal design is necessary, since the work environment is dynamic and susceptible to changing influences (De Lange, et al., 2002; Roe, 2008). The aim of this study is therefore to

examine the relationship between work conditions and higher order goal facilitation at work and, whether (changes in) work conditions and goal facilitation are predictors of well-being outcomes in a longitudinal design.

Research Questions

This longitudinal study aims to predict well-being outcomes of health care employees. It elaborates on the accumulating evidence that favorable changes in work conditions and higher order goal facilitation are beneficial for well-being of health care employees in the long run. Work conditions, higher order goal facilitation and well-being outcome variables were measured at a baseline (T1) and at a three-year follow up (T2). The following research questions guided our study: (1) Do changes in work conditions predict higher order goal facilitation among health care employees, independent of age, gender and baseline higher order goal facilitation and if so, which work conditions have a positive or negative influence on higher order goal facilitation? (2) Do both changes in work conditions (demands, control, social support, role ambiguity and job insecurity) and higher order goal facilitation predict well-being outcomes among health care employees, independent of demographic characteristics, baseline well-being outcomes, work conditions and higher order goals, and if so which changes affect well-being outcomes favorable or unfavorable?

6.2 Method

Sample and Procedure

In this study data was collected among health care employees in six health care centers for disabled people. Three health care centers were assigned to an experimental condition, and received an intervention focusing on improvement of work conditions. The other three health care centers were used as a control group and received no intervention. The effect evaluation of this intervention is presented in Chapter 5. The focus in this chapter is on the impact of instigated and natural changes in work conditions on higher order goal facilitation and employee well-being.

At T1 3680 staff members of six health care centers were invited to participate. Out of this number, 1673 employees (45.5%) filled in the questionnaire on work conditions, facilitation of higher order goals, and well-being. At T2 (three years after T1) 1466 of the 3626 staff members participated, which results in a response rate of 40.4%. Of the participants at the first measurement (T1) 707 employees (42.6%) completed the questionnaire at the second measurement (T2) three years later. Due to high turnover levels, about 15-20 % of the participants of the original sample could not be invited for T2. Participation was on a voluntary basis and questionnaire identification codes were used. Only the researchers had access to the key relating the

codes to individual employees. Furthermore, confidentiality of personal information was guaranteed. The measurements included the completion of a questionnaire.

The research sample that participated at both T1 and T2 (N=707; research group) differed from the sample that participated at T1 only (N=977; drop-out group) on several variables (see Appendix II). With respect to the demographic variables, the employees in the research group were older than in the dropout group (53.7% was between 36-52 years old in the research group vs. 40.0% in the dropout group) and a higher percentage of the research group was married (74.3% vs. 69.5%). Furthermore, more employees in the research group worked as graduated care employees compared to the dropout group (35.9% vs. 26.1%), while less employees in the research group worked as assisting employees (30.8% vs. 41.1%). Moreover, a higher percentage of the employees worked 6-10 years, thus a longer period of time, in the current sector compared to the dropout group (27.0% vs. 21.0%) and in the current health care center (27.2% vs. 21.9%). In addition, the employees from the research group worked more hours per week compared to the drop-out group (31.1% worked 13-24 hours per week vs. 26.7% of the dropout group) and they worked more in day shifts (40.0% vs. 31.7%). Concerning the work conditions, the employees in the research group experience more decision authority (mean: 3.03 vs. 2.95), more support form supervisor (mean: 2.86 vs. 2.79) and less job insecurity (mean: 1.78 vs. 1.90). Finally, with regard to well-being, the research group scores higher on higher order goal facilitation (mean: 10.02 vs. 9.89), job satisfaction (mean: 2.90 vs. 2.81), personal competence (mean: 5.12 vs. 5.07), less psychological distress (mean: 19.39 vs. 20.16) and less somatic complaints (mean: 16.25 vs. 16.93). In general is found that the quality of work and well-being in the research group is more favorable, compared to the drop-out group.

Measures

The respondents filled in a questionnaire which consists of: a) socio demographic variables, b) work conditions, c) higher order goal facilitation, d) job satisfaction, e) psychological distress & somatic complaints and f) burnout.

a) Socio-demographic variables

The following socio-demographic variables were assessed: age, gender, educational level, years of employment, years working in health care, and shift work.

b) Work conditions

Work conditions were assessed with the Leiden Quality of Work Questionnaire (LQWQ; Maes, Van der Doef & Verhoeven, 1993; Van der Doef & Maes, 1999b). All items are phrased as statements with four answering categories (1=disagree

completely, 2=disagree, 3=agree, and 4=agree completely). The factor structure of the questionnaire was assessed and cross-validated in two sub-samples of 2000 men and women from a large sample of the Dutch working population (Van der Doef & Maes, 1999b). Confirmatory factor analyses indicated that the questionnaire measures eleven job conditions and the outcome variable of job satisfaction with a satisfactory reliability (Crohnbach's alpha ranging from .73 to .93) (Van der Doef & Maes, 1999b).

The LQWQ assesses the three key concepts of the Karasek model; job demands, control, and social support with the following scales:

- Job demands are assessed by work and time pressure (α=.73; 4 items; e.g., "My job requires working very fast").
- Control is measured through decision authority (α=.74; 4 items; e.g., "I have a lot to say about what happens on my job"), skill discretion (α=.76; 8 items; e.g., "I get to do a variety of different things on my job") and task control (α=.73; 4 items; e.g., "I can determine my work pace")
- Social support is measured with the scales social support from supervisor (α=.89; 6 items; e.g., "My supervisor cares about our concerns") and social support from co-workers (α=.82; 6 items; e.g., "I feel appreciated by my colleagues")

Other work conditions included in this study were role ambiguity (α=.75; 6 items; e.g.: "I know exactly which are my tasks") and job insecurity (α=.75; 3 items: e.g.: "I expect to lose my job within the next five years"). For the interpretation: a high score on the subscales skill discretion, decision authority, task control, social support from supervisor, and social support from co-workers indicates a favorable work situation. On the other subscales, i.e. work and time pressure, role ambiguity, physical exertion, hazardous exposure, and job insecurity, a low score indicates a favorable work situation.

c) Higher Order Goal Facilitation

Higher order goal facilitation was measured with the workplace version of the goal facilitation inventory (GFI-W; Maes & Karoly, 2005; Ter Doest et al., 2006). The questionnaire consists of fifteen items representing work's facilitation of goals (α=.93; e.g.: "Keeping up my self confidence", and "Receiving support from others"). Respondents answered the same question for each of 15 higher order goals: "To what extent can you achieve the following things through your work?" Answers were provided, separately for each goal, on a five-point scale (1= to a very limited extent; 5= to a very great extent).

d) Job satisfaction

Job satisfaction was assessed with the job satisfaction scale of the LQWQ (α=.84; 6 items; e.g., "I am satisfied with my job"). Responses were given on a 4-point rating scale, with higher scores indicating higher job satisfaction.

e) Psychological Distress & Somatic Complaints

Psychological distress, a composite of anxiety and depression, and somatic complaints were assessed with the validated Dutch version of the Symptom Checklist (SCL-90; Arrindel & Ettema, 1986; Derogatis, 1983). This inventory measures the occurrence of psychological and physical complaints on a five points scale (1 = not at all, 5 = very much). Two subscales were used to measure psychological distress: anxiety (α=.88; e.g. 10 items; "Feeling afraid") and depressive complaints (α=.91; 16 items; e.g., "Feeling lethargic'). A mean score of these two subscales was calculated, because of high correlation between the two scales (r = .81). Somatic complaints was the third subscale used from the SCL-90 (α=.83; 12 items; e.g., "Pain in the chest or heart region").

f) Burnout

Burnout was measured by the UBOS-C (Schaufeli & Van Dierendonck, 2000), a validated Dutch version of the Maslach Burnout Inventory (MBI; Maslach, Jackson & Leiter, 1996) for health care employees. The UBOS-C consists of 22 statements, divided over three burnout dimensions which were evaluated in this study: emotional exhaustion (α=.76; 8 items; "I feel exhausted because of my work"), personal competence (α=.77; 5 items; "I have accomplished many valuable things at my job") and depersonalization (α=.86; 7 items; "I have the feeling that I treat some clients too impersonal"). Items were scored on seven-point rating scales ranging from '1=never' to '7=every day/always'.

Data analyses

In order to check whether the research sample was representative, the employees who completed the questionnaire at T1 as well as T2 (N=707) were compared with the employees who participated only at T1 (N=977) on baseline socio-demographic variables, work conditions, higher order goal facilitation, and well-being outcomes). Chi-square tests and t-tests were used to perform the analyses. Skewness has been calculated for all work conditions and outcomes. From a traditional point of view (Morgan et al., 2004) in large samples as ours the criterion for normality is a skewness that falls within a range of -1.0 to +1.0. All variables fall within this range. As a consequence the requirements for univariate and multivariate analyses are not violated.

Hierarchical multiple regression analyses were performed to examine 1) to which extent changes in work conditions explained variance in higher order goal facilitation at T2 and 2) to which extent changes in work conditions and higher order goal facilitation explained variance in job satisfaction, psychological distress, somatic complaints, emotional exhaustion, depersonalization and personal competence at T2. The analyses were performed with the data from employees that completed the questionnaire at T1 as well as T2 (N=707). Hierarchical regression models were constructed, in which the independent variables were entered in a predetermined order. The F change was evaluated to determine whether the newly introduced variables led to a significant increase in explained variance in the outcome.

In the first regression analysis, the socio-demographic characteristics gender and age were entered into the equation. In a second step, the initial level of higher order goal facilitation was controlled for. Thirdly, work conditions, were examined, introducing skill discretion, decision authority, task control, work and time pressure, social support from supervisors, social support from co-workers, role ambiguity, and job insecurity. In the final step, it was examined to which extent changes in work conditions between T1 and T2 were related to higher order goal facilitation at T2.

In a second series of regression analyses the steps were 1) socio-demographic characteristics gender and age, 2) the initial level of the outcome variable and 3) the work conditions at T1. In the fourth step, higher order goal facilitation at T1 was added. In the final two steps, it was examined to which extent changes in work conditions and changes in higher order goal facilitation between T1 and T2 were related to well-being outcomes at T2. A standardized change score (Cohen's Delta; differences between T1 and T2 divided by standard deviation at T1) was computed for the work conditions and facilitation of higher order goals.

6.3 Results

The correlation between the scales (table 6.1a/b) indicate that most factors were weak to moderately related ($r<.50$). A few variables were more strongly related. For example, task control and decision authority were strongly related, representing the overlapping concept of control at work. Moreover, emotional exhaustion, depersonalization and personal competence are strongly related, representing the overlapping concept of burnout. These correlations are in line with results found in previous studies (Van der Doef & Maes, 1999; Akerboom & Maes, 2006).

Table 6.1a. Intercorrelations between work conditions, ORFs en well-being outcomes between T1 and T2 (N=707).

	1	2	3	4	5	6	7	8	9	10	12	13	14	15	16	17
Skill DiscretionT1 (1)	1															
Decision Authority T1 (2)	.348 ***	1														
Task control T1 (3)	.131 ***	**.532** ***	1													
Time and work pressure T1 (4)	.257 ***	-.172 ***	-.264 ***	1												
Role ambiguity T1 (5)	-.108 **	-.297 ***	-.193 ***	.101 **	1											
Job insecurity T1 (6)	-.143 ***	-.231 ***	-.097 *	.005	.345 ***	1										
Social sup. from supervisor T1 (7)	.197 ***	.197 ***	.140 ***	-.137 ***	-.375 ***	-.224 ***	1									
Social sup. from coworkers T1 (8)	.227 ***	.139 ***	.101 **	-.029	-.356 ***	-.241 ***	.343 ***	1								
Communication T1 (9)	.174 ***	.0185	.009	.176 ***	.201 ***	.0286	-.087 *	-.100 *	1							
Training Oppurtunities T1 (10)	-.161 ***	-.132 **	-.176 ***	.076	.163 ***	.076	-.239 ***	-.090	.100 *	1						
Job satisfaction T1 (11)	.285 ***	.280 ***	.217 ***	-.172 ***	-.391 ***	-.313 ***	.321 ***	.303 ***	-.123 **	-.163 ***	1					
Higher order goal fac. T1 (12)	.167 ***	.258 ***	.223 ***	-.101 *	-.374 ***	-.254 ***	.314 ***	.281 ***	-.055	-.160 **	.350 ***	1				
Emotional Exhaustion T1 (13)	.011	-.229 ***	-.228 ***	.309 ***	.312 ***	.101 **	-.230 ***	-.207 ***	.195 ***	.123 **	-.441 ***	-.345 ***	1			
Depersonalization T1 (14)	-.117 **	-.217 ***	-.106 **	.092 *	.312 ***	.115 **	-.152 ***	-.198 ***	.211 ***	.056	-.304 ***	-.284 ***	**.505** ***	1		
Personal Compentence T1 (15)	.288 ***	.208 ***	.082 *	.001	-.272 ***	-.209 ***	.213 ***	.234 ***	.010	-.109 *	.332 ***	.346 ***	-.303 ***	-.412 ***	1	
Skill DiscretionT2 (16)	.605 ***	.275 ***	.094 *	.165 ***	-.037	-.111 **	.128 **	.098 **	.121 **	-.126 **	.149 ***	.107 **	-.020	-.065	.253	1
Decision Authority T2 (17)	.219 ***	.524 ***	.337 ***	-.143 ***	-.200 ***	-.142 ***	.148 ***	.162 ***	-.040	-.148 **	.191 ***	.235 ***	-.158 ***	-.180 ***	.190 ***	.381 ***
Task control T2 (18)	.113 **	.368 ***	**.527** ***	-.180 ***	-.202 ***	-.094 *	.181 ***	.076 *	-.024	-.137 **	.132 ***	.228 ***	-.157 ***	-.081 *	.098 **	.155 ***
Time and work pressure T2 (19)	.197 ***	-.064	-.089 *	.489 ***	.094 *	-.018	-.026	-.028	.195 ***	.001	-.017	-.068	.126 **	.015	.048	.255 ***
Role ambiguity T2 (20)	-.075 *	-.161 ***	-.114 **	.079 *	.481 ***	.198 ***	-.268 ***	-.286 ***	.364 ***	.137 **	-.189 ***	-.296 ***	.212 ***	.229 ***	-.232 ***	-.143 ***
Job insecurity T2 (21)	-.077 *	-.071	-.008	.022	.195 ***	.346 ***	-.160 ***	-.214 ***	.123 **	.069	-.234 ***	-.176 ***	.164 ***	.168 ***	-.144 ***	-.151 ***
Social sup. from supervisor T2 (22)	.107 **	.157 ***	.102 **	-.118 **	-.203 ***	-.106 **	.412 ***	.227 ***	-.293 ***	-.197 ***	.155 ***	.186 ***	-.117 **	-.131 **	.190 ***	.228 ***
Social sup. from coworker T2 (23)	.142 ***	.112 **	.072	-.034	-.252 ***	-.118 **	.211 ***	.436 ***	-.179 ***	-.141 **	.170 ***	.218 ***	-.152 ***	-.177 ***	.215 ***	.211 ***
Communication T2 (24)	.132 **	.037	.085	.223 ***	.238 ***	.045	-.207 ***	-.172 ***	**.636** ***	.179 ***	-.183 ***	-.123 *	.182 ***	.174 ***	-.009	.121 **
Training Oppurtunities T2 (25)	-.115 **	.021	-.025	.005	.096 *	-.014	-.149 ***	-.110 **	.182 ***	.490 ***	-.071	-.088 *	-.005	.017	-.07	-.233 ***
Job satisfaction T2 (26)	.148 ***	.209 ***	.151 ***	-.115 **	-.275 ***	-.132 **	.204 ***	.153 ***	-.256 ***	-.147 **	.424 ***	.298 ***	-.272 ***	-.210 ***	.216 ***	.325 ***
Higher order goal fac. T2 (27)	.146 ***	.137 ***	.153 ***	-.108 *	-.231 ***	-.150 ***	.223 ***	.184 ***	-.172 ***	-.139 **	.205 ***	.416 ***	-.184 ***	-.134 ***	.271 ***	.197 ***
Emotional Exhaustion T2 (28)	.020	-.138 ***	-.152 ***	.183 ***	.220 ***	.035	-.110 **	-.149 ***	.293 ***	.078	-.226 ***	-.179 ***	**.570** ***	.283 ***	-.165 ***	-.046
Depersonalization T2 (29)	-.122 **	-.157 ***	-.109 **	.061	.221 ***	.067	-.083 *	-.182 ***	.279 ***	.065	-.201 ***	-.193 ***	.367 ***	**.558** ***	-.271 ***	-.123 **
Personal Competence T2 (30)	.325 ***	.136 ***	.011	.033	-.098 *	-.137 ***	.125 **	.192 ***	.026	-.125	.205 ***	.256 ***	-.183 ***	-.326 ***	.523 ***	.367 ***

**** p<.001; ** p<.01; * p<.05; (two-tailed); strong correlations (r>.50) are printed Bold*

Table 6.1b. Intercorrelations between work conditions, ORFs en well-being outcomes between T1 and T2 (N=707).

	17	18	19	20	21	22	23	24	25	26	27	28	29
Decision Authority T2 (17)	1												
Task control T2 (18)	.420 ***	1											
Time and work pressure T2 (19)	-.146 ***	-.234 ***	1										
Role ambiguity T2 (20)	-.315 ***	-.262 ***	.107 **	1									
Job insecurity T2 (21)	-.180 ***	-.082 *	-.056	.277 ***	1								
Social sup. from supervisor T2 (22)	.289 ***	.218 ***	-.175 ***	-.411 ***	-.136 ***	1							
Social sup. from coworker T2 (23)	.261 ***	.130 **	-.025	-.395 ***	-.232 ***	.279 ***	1						
Communication T2 (24)	-.014	.042	.142 **	.249 ***	.141 **	-.205 ***	-.246 ***	1					
Training Oppurtunities T2 (25)	-.117 **	-.051	-.003	.194 ***	.057	-.317 ***	-.104 *	.168 **	1				
Job satisfaction T2 (26)	.382 ***	.285 ***	-.151 ***	-.394 ***	-.288 ***	.390 ***	.344 ***	-.199 ***	-.232 ***	1			
Higher order goal fac. T2 (27)	.215 ***	.162 ***	-.065	-.313 ***	-.162 ***	.299 ***	.245 ***	-.089	-.171 ***	.343 ***	1		
Emotional Exhaustion T2 (28)	-.186 ***	-.174 ***	.287 ***	.303 ***	.159 ***	-.219 ***	-.175 ***	.169 ***	.044	-.435 ***	-.309 ***	1	
Depersonalization T2 (30)	-.192 ***	-.081 *	.012	.301 ***	.176 ***	-.172 ***	-.205 ***	.207 ***	.077	-.283 ***	-.206 ***	.481 ***	1
Personal Competence T2 (29)	.230 ***	.095 *	.042	-.199 ***	-.158 ***	.173 ***	.202 ***	-.003	-.137 **	.254 ***	.314 ***	-.216 ***	-.361 ***

**** p<.001; **p<.01; *p<.05; (two-tailed)*

In answer to the first research question, whether changes in work conditions predict higher order goal facilitation at T2, the results of the analyses presented in table 6.2 are discussed. The final model, including socio-demographics, work conditions at T1 and the change in work conditions between T1 and T2, successfully explained 23% of the variance in higher order goal facilitation at T2. For higher order goal facilitation at T2, all steps except step 1 (age and gender) significantly improved the amount of explained variance. Goal facilitation at T1 explained an additional 13% of the variance, work conditions at T1 and additional 4%, and in the last step changes in work conditions added 8% to the explained variance in goal facilitation at T2. In the final model, significant predictors of higher orde goal facilitation at T2 are: higher goal facilitation at T1, higher skill discretion and social support from supervisor at T1, lower time and work pressure and role ambiguity at T1, increased skill discretion and social support from supervisor between T1 and T2 and reduced role ambiguity between T1 and T2.

Table 6.2 Results of hierarchical regression analyses for the total sample group (N=707) examining the effect of age and gender, higher order goal facilitation at T1, work conditions at T1 and change in work conditions between T1 and T2 on higher order goal facilitation at T2.

Higher order goal facilitation T2		
	Δ R^2	β
Gender	.001	-.005
Age		.028
Outcome at T1	.129***	.260***
Skill Discretion (T1)	.036***	.152**
Decision Authority (T1)		-.034
Task Control (T1)		.054
Time/work pressure (T1)		-.109*
Role Ambiguity (T1)		-.122*
Job Insecurity (T1)		-.059
Social Support Supervisor (T1)		.171***
Social support co-workers (T1)		.016
Δ Skill Discretion	.084***	.103*
Δ Decision Authority		.049
Δ Task Control		-.019
Δ Time/work pressure		-.047
Δ Role Ambiguity		-.128**
Δ Job Insecurity		-.059
Δ Social Support Supervisor		.167***
Δ Social support co-workers		.051
Full model : adj. R^2 = .230. F(19 , 687) = 12.112***		

** p < .05; ** p < .001 Δ (delta) : standardized change in work condition between T1 and T2 ((T2-T1)/S.D. Note. Regression weights (β) are from the full model.*

Furthermore, in answer to the second question whether changes in both work conditions and higher order goal facilitation predict well-being outcomes, the predetermined model for the second series of hierarchical regression analyses explained 47% of the variance in job satisfaction, 18% in psychological distress, 22% in somatic complaints, 45% in emotional exhaustion, 34% in depersonalization and 35% of the variance in personal competence (see table 6.3). The independent variables were added to the equation in six steps for all six well-being outcomes. In the first step, gender and age significantly predict 1.6% of the variance in somatic complaints and 1,8% of the variance in depersonalization at T2. In particular, being female is associated with having more somatic complaints.

The corresponding outcome scores at T1, entered in the second step of the analyses, explain 15% to 32% of the variance in the well-being outcomes at T2.

In the third step, work conditions at T1 significantly predicted job satisfaction and personal competence (resp. 2.1% and 4.0% variance explained) at T2. More specifically: high levels of skill discretion and social support from supervisor, and low levels of time and work pressure and role ambiguity at T1 are positively associated with job satisfaction at T2, while a high level of skill discretion at T1 is positively related to personal competence at T2.

Next (step 4) higher order goal facilitation at T1 explained and additional 1.4% of the variance in job satisfaction and 0.4% of the variance in personal competence.

In the fifth step, changes in work conditions predict an additional 3% to 25% of the variance in the well-being outcomes at T2. Particularly, increases in skill discretion, decision authority, task control, social support from supervisor and social support from co-workers, and decreased time and work pressure, role ambiguity and job insecurity, predict higher job satisfaction at T2. Further, a reduction in time and work pressure and role ambiguity is associated with lower psychological distress at T2 and increased job security is related to less somatic complaints at T2. Besides, lower levels of time and work pressure and role ambiguity predict lower emotional exhaustion at T2, while reduced role ambiguity is related to lower depersonalization at T2. Additionally, an increase in skill discretion predicts higher personal competence at T2.

Finally, in the last step changes in facilitation of higher order goals appear to be a significant predictor explaining an additional 1.4% of the variance in job satisfaction at T2, 0.9% of the variance in psychological distress at T2, 1.3% of the variance in somatic complaints at T2, 4.4% of the variance in emotional exhaustion at T2, 0,4% of the variance in depersonalization at T2 and 1.1% of the variance in personal competence. In summary, even though well-being outcomes at T1 and the changes in work conditions are the strongest predictors for well-being outcomes at T2, changes in higher order goal facilitation is still a significant predictor in the last step after

Table 6.3 Results of hierarchical regression analyses for the total sample group (N=707) examining the effect of age and gender, outcome at T1, work conditions and goal facilitation at T1 and change between T1 and T2 for work conditions and goal facilitation on job satisfaction, psychological distress, somatic complaints, emotional exhaustion, depersonalization and personal competence at T2.

	Job Satisfaction		**Psychological Distress**		**Somatic complaints**		**Emotional Exhaustion**		**Depersonalization**		**Personal Competence**	
	ΔR2	β	**ΔR2**	β	**ΔR2**	β	**ΔR2**	β	**ΔR2**	β	**ΔR2**	β
Gender	.004	.030	.005	.091*	.016**	.113**	.001	.005	.018**	-.053	.007	.030
Age		.078**		.008		.027		.029		.022		-.011
Outcome at T1	.178***	.342***	.149***	.392***	.181***	.410***	.320***	.554***	.292***	.499***	.264***	.415***
Skill Discretion	.021*	.120**	.012	.060	.007	.007	.006	-.001	.012	-.064	.040***	.263***
Decision Authority		.082		.052		.041		.005		-.009		.038
Task control		.048		-.021		.001		-.020		-.023		-.059
Time/work pressure		-.066		.051		.017		.112**		.000		-.031
Role ambiguity		-.112**		-.032		.033		.117**		.145**		.055
Job insecurity		-.047		.078		.143**		.003		.008		-.036
Social support supervisor		.079*		.029		.025		.031		.043		-.046
Soc. support co-workers		.047		-.050		-.035		-.005		-.041		.056
Higher order goal facilitation	.014***	.196***	.002	-.110*	.000	-.097*	.001	-.131**	.000	-.049	.004*	.162***
Δ Skill Discretion	.252***	.208***	.029**	-.003	.029**	-.039	.100***	-.043	.035***	-.025	.040***	.146***
Δ Decision Authority		.102**		.036		.057		.015		-.026		.065
Δ Task control		.088*		.067		-.010		.012		.038		.025
Δ Time/work pressure		-.123***		.138**		.110**		.266***		-.006		-.018
Δ Role ambiguity		-.097*		.109*		.065		.127**		.157***		-.044
Δ Job insecurity		-.134***		.087		.136**		.059		.052		-.027
Δ Social support supervisor		.164***		.052		.035		-.039		-.037		-.015
Δ Soc. support co-workers		.156***		-.022		-.011		.002		-.015		.006
Δ Higher order goal facilitation	.014***	.155***	.009**	-.124**	.013**	-.149**	.044***	-.278***	.004*	-.079*	.011**	.137**
Full model	Adj.R^2= .467 F(21, 685) = 30.451***		Adj.R^2= .180 F(21, 685) = 8.387***		Adj.R^2= .223 F(21 , 685)= 10.623***		Adj.R^2= .445 F(21, 685)= 29.028***		Adj.R^2= .342 F(21, 685)= 18.436***		Adj.R^2= .347 F(21, 685)= 18.833***	

** p < .05; ** p <.01; *** p<.001. Δ (delta): change in work condition between T1 and T2 ((T2-T1) / S.D. T1). Note. Regression weights (β) are from the full model.*

entering gender, age, baseline outcome scores, work conditions, higher order goal facilitation and changes in work conditions. In general, favorable changes in work conditions and higher order goal facilitation predict well-being outcomes among health care employees accounting for age, gender and baseline well-being outcomes.

6.4 Discussion

The findings of this study provide support for the notion that (changes in) work conditions are related to higher order goal facilitation at work and that (changes in) work conditions and higher order goal facilitation are independent predictors of well-being outcomes among health care employees. While previous studies observed the influence of (changes in) work conditions on well-being outcomes (Gelsema et al., 2006; Häusser et al., 2010), the present study examined the influence of changes in higher order goals and work conditions on well-being. The whole model, including (changes in) work conditions, and higher order goal facilitation best predicted job satisfaction and emotional exhaustion. The predictive power of work conditions and higher order goal facilitation on the other well-being outcomes was more moderate.

With respect to the first research question, the results suggest that facilitation of higher order goals through work is significantly predicted by increased social support from the supervisor, increased skill discretion and decreased role ambiguity. When health care employees have good education and learning possibilities, clear job and task descriptions, experience more social support from their supervisor and security in their performance, they are better facilitated in attaining their higher order goals. In cross-sectional studies the relation between higher order goal facilitation and work conditions has been found (Ter Doest et al., 2006). However, so far, no longitudinal research has been done on the influence of changes in work conditions on higher order goal facilitation in a health care population. The findings of this study offer new insight in research on quality of work with health care employees, and the attainment of higher order goal facilitation at work should be taken in to account in future research. These findings are also important from a theoretical point of view. Self-regulation theory (Ford, 1992; Bandura, 1989; Maes & Karoly, 2005) states that the achievement of personal goals is closely related to satisfaction and well-being. This is not only true for everyday life, but also at work as was shown by several authors (Christiansen, Backman, Little & Nguyen, 1999; Harris, Daniels & Briner, 2003; Kehr, 2003; Ter Doest et.al., 2006). However, very few studies have explored so far determinants of personal goal facilitation at work from a theoretical perspective such as e.g. the JDCS model or the TRIPOD model. As a consequence, this is one of the first studies showing that well defined job and environmental characteristics are determinants of (higher order) goal facilitation.

Our second research question was whether changes in work conditions together with changes in higher order goal facilitation could predict well-being outcomes of health care employees after controlling for baseline scores. The inclusion of changes in work conditions and higher order goal facilitation considerably improved the prediction of all outcomes at T2. In particular, changes in work conditions are most strongly related to job satisfaction and emotional exhaustion. The impact of changes in work conditions is weaker for psychological distress, somatic complaints, depersonalization and personal competence, which is in accordance with other (longitudinal) studies that examined multiple stress-related outcomes (Van der Doef., 2000; Gelsema et al., 2006; Bourbonnais et al., 2006). An explanation for these findings might be that psychological distress, somatic complaints, depersonalization and personal competence are factors which are more influenced by circumstances outside the work environment, e.g. personality of the employee. This study also shows that beneficial changes in higher order goal facilitation positively affect job satisfaction, psychological distress, somatic complaints, depersonalization, personal competence and especially emotional exhaustion. For job satisfaction and personal competence both skill discretion and higher order goal facilitation appeared to be the best predictors. Apparently, health care employees feel more satisfied and competent when they receive enough possibilities to learn new skills at the workplace, to perform their tasks with clients or work processes. Moreover, they experience more job satisfaction and personal competence when they are able to reach their highly valued goals through their daily work. The best predictors for emotional exhaustion are time/work pressure and not being facilitated to reach higher order goals through work. These findings suggest that in future research, an intervention approach, including a phase of goal setting might be used to improve job satisfaction and well-being of the health care employees and to prevent that these professionals get burnout. These suggestions are in line with findings in earlier studies on burnout (Paris & Hoge, 2003) and burnout intervention programs (Le Blanc et al., 2007). Our findings are equally important from a theoretical perspective, since it is shown that both higher order goal facilitation and changes in higher order goal facilitation are related to psychosomatic complaints and burnout, in addition to job and environmental characteristics. As personal goal facilitation is a self-regulatory construct, this shows that not only the achievement of work related goals or demands and the resources to achieve these work goals have important consequences, but as well the extent to which work settings allow for the achievement of personal goals, that are set by the individual rather than by the employer or work setting. It is therefor advisable to explore in the future, e.g. by means of a screening, to what extent a specific work setting allows for personal goal facilitation.

The results from this study indicate that in order to positively influence higher order goal facilitation and job satisfaction of health care employees, skill discretion and social support at work should be improved. This could be done by means of e.g. in service training, including skills and communication training for employees as well as managers. Lowering job demands by e.g. hiring more staff and increasing work efficiency, in order to give health care employees more time to provide high-quality care provide may facilitate personal goal attainment at work and increase job satisfaction. The results also suggest that decreasing role ambiguity and time and work pressure might be important to decrease psychological distress. Somatic complaints could be reduced when employees experience less work pressure and job insecurity, this can be achieved by creating a comprehensible organizational structure, by hiring new staff and by providing more long term contracts. In addition, depersonalization might be improved by providing employees with a clear job description and adequate feedback, in order to reduce role ambiguity. To increase personal competence of health care employees, they could profit from training in job resources in order to achieve their goals.

Limitations and recommendations

The present study also has some limitations. The results show that the dropout at T2 is somewhat biased. The employees in the final research group are better off at T1 in terms of work conditions and well-being. This may be partly caused by a common bias in longitudinal research that is known as the healthy worker effect: unhealthy workers are more likely to have quit their jobs at the second measurement moment, hence the healthy workers are overrepresented in the sample of workers that respond at both times (Li & Sung, 1999). This has implications for the generalizability of the results of this study, because healthy workers might report higher levels of quality of work and well-being which causes a positive bias. A second limitation concerns the design of our study, a two wave panel design with a time interval of three years. The choice of a time interval should ideally be based on how the impact of work conditions and facilitation of higher order goals on outcomes evolves over time (Gelsema et al., 2006). Therefore it is suggested that future studies explore the influence of changes in multiple waves with different time intervals, so that the time process underlying the mutual influence of work conditions and different wellness outcomes is further clarified.

This study supports the suggestion that research on the work-health relationship would benefit from a more comprehensive measurement of work environment beyond the JDCS model. Although explained variance is high for emotional exhaustion and job satisfaction, more research is needed on organizational and environmental determinants that predict somatic complaints, psychological distress,

depersonalization and personal competence. Furthermore, this study shows that the work environment is dynamic and that within three years, changes in work conditions and higher order goal facilitation are related to well-being of individual employees. A repeated measures design, with more frequent assessments of the work situation, higher order goal facilitation, and well-being of employees could further clarify their dynamic relation. To gain even more insight into this dynamic relation more research on the interactions between the predictors higher order goal facilitation, quality of work determinants and other unmeasured third variables is also advised (Ter Doest et al., 2006; Pomaki et al., 2004).

In conclusion, the results of this study are consistent with earlier research on work conditions and confirm the relation between work conditions and well-being of health care employees (Häusser et al., 2010; Van der Doef et al., 2000). In addition, (changes) in higher order goal facilitation that have scarcely been studied, also seem to add to the picture. The results furthermore suggest that the work place of health care employees is dynamic. Next to changes in work conditions, changes in higher order goal facilitation also influence their well-being. It can therefore be concluded that well-being is also influenced by attainment of higher order goals at work and not merely by work content of health care employees. Therefore, in future research but certainly for health care management, it is important to pay attention to the degree in which the work environment facilitates the attainment of employees' higher order goals. For health care managers, the findings of this study can be the start for interventions that focus on both the work environment and the facilitation of their employees higher order goals.

CHAPTER 7

General discussion

7.1 Introduction

The main goal of this thesis was to gain more insight into the wellness effects of worksite health promotion programs for health care employees. A variety of theoretical models has added to our general knowledge about the effectiveness of worksite interventions, directed at improvement of e.g. work conditions, organizational risk factors, job satisfaction (Karasek, 1979; Johnson et al., 1995; Häusser et al., 2010; Wagenaar et al., 1994; 1997; Lavoie-Tremblay, 2004; Bourbonnais et al., 2006; D'Zurilla & Goldfried, 1971; Watson & Tharp, 2006). While these models have improved our understanding of effective components of worksite health promotion programs for health care employees, most of these programs did not use a participatory implementation approach to improve quality of work and well-being of health care employees.

The aim of this general discussion is to reflect on the main results of this thesis and put them into a broader perspective. Therefore, this chapter starts with a summary of the main results, followed by an attempt to integrate these findings from a theoretical and methodological perspective. Finally, practical implications and recommendations for future research are made.

Summary of the main results

In *Chapter 2*, interventions to improve quality of work and well-being of health care employees were reviewed. The findings of this review indicated that the most consistent favorable intervention effects were found for job demands, social support, psychological distress, job satisfaction and emotional exhaustion. Moreover a participatory implementation approach of a worksite health promotion program might be more effective to improve quality of work of health care employees. A problem solving perspective however, which shares similarities with the participatory approach, showed an emphasis on the goal directed, pro-active and monitoring aspects of employee functioning and could guide the implementation of future interventions.

In *Chapter 3* of this thesis, some of the well-known theories in the field of worksite interventions were discussed. Next to a work conditions and organizational perspective, which formed together the content of the intervention program, a problem solving perspective to implement a theoretically based intervention program at the worksite was introduced. This perspective appeared to be a suitable implementation framework for improving quality of work of health care employees. Practical implications for an intervention program were derived from these three perspectives.

Chapter 4 described a work conditions, organizational risk factors and well-being screening of health care employees in six Dutch health care centers for disabled people. Three health care centers were randomly selected as intervention group (W1,

W2 and W3), each health care center was screened separately and compared to a reference group (the other 5 centers). T-test results showed that each of the six health care centers differed significantly from the reference group on specific work conditions and organizational risk factors. Furthermore, the results regarding the outcome variables indicated that these health care centers also showed significant differences in comparison to the reference group on several well-being outcomes. In addition, advise was given to the intervention group on which factors they could improve the quality of work of the health care employees, the intervention targets were set and intervention plans were made in order to improve the quality of work factors.

Chapter 5 described the effects of a problem solving intervention program on improving quality of work of health care employees and employees' well-being. The intervention study was conducted in six health care centers including 707 health care employees. The employees completed a questionnaire at T1 and three years later (T2). Results partly support the hypotheses: some work conditions and organizational risk factors improved significantly at T2 for the intervention group compared to the control group. Whereas positive effects were found for several work conditions and organizational risk factors of the health care employees, no significant main effects were found on well-being outcome variables.

In a longitudinal study *(Chapter 6)* it was examined whether (changes in) work conditions and higher order goals affect wellness outcomes among health care employees. Hierarchical regression analyses, controlling for baseline levels, showed that changes in work conditions were a significant predictor of higher order goal facilitation. In addition, changes in work conditions and higher order goal facilitation predicted employee well-being outcomes. Most variance was explained in job satisfaction and emotional exhaustion. The inclusion of higher order goal facilitation at work, next to work conditions, could provide additional insights into the improvement of well-being outcomes of health care employees.

General conclusion

Overall, the results of this thesis indicated that work conditions and organizational risk factors appeared to be important intervention targets, while a problem solving approach might be a fruitful addition to existing interventions for health care employees. The studies in this thesis showed that quality of work of health care employees improved significantly after such a problem solving intervention. Moreover, (changes in) work conditions and higher order goal facilitation were related to well-being outcomes of these health care employees.

7.2 Reflections from a theoretical perspective

This thesis clearly shows the advantage of screening instruments, that are based on theoretical models of job and organizational characteristics. First of all because the different subscales refer directly to these models and thus allow to analyze the determinants of possible adverse consequences, such as psychological distress, somatic complaints or burnout. Secondly, because this allows for comparison with other studies and finally because in view of interventions, it is important to understand why rather than that things change.

This thesis also shows that work conditions and organizational characteristics that are theoretically grounded can be influenced or changed by means of an intervention, and that such an intervention can indeed have beneficial effects. However, it is harder to understand from a theoretical perspective that (some) work conditions and organizational factors seemed to change, but that this had no effect on well-being outcomes such as job satisfaction, higher order goal facilitation, emotional exhaustion, depersonalization and personal competence. The core tenet of the job and environmental conditions models is indeed that these models define determinants that directly affect these well-being outcomes. While we have offered several explanations for this lack of effect on well-being outcomes, such as the fact that the intervention also had a negative effect on communication, the fact that the effect on determinants may not have been sufficient and that the content of the intervention program may not have been optimal, this remains puzzling. Future research should further look into this missing link.

Finally, this is one of the first studies to relate self-regulation contructs, such as personal goal facilitation, to theoretically grounded job and environmental characteristics. This study shows that personal goal facilitation is an important goal construct, that can explain additional variance in various outcomes. Future studie should however explore the possible moderating or mediating role of personal goal facilitation in de relationship between job and environmental characteristics with different outcomes.

7.3 Is problem solving an effective intervention approach?

The surplus value of a problem solving approach in explaining and influencing quality of work and well-being of health care employees has been proven in many different areas (Nezu, Palmatier & Nezu, 2004). Problem solving theory provides a solid theoretical framework from which practical implications for interventions can be derived. Problem solving theory also proved to be effective in explaining and predicting determinants of quality of work in worksite health promotion projects. The importance of key elements in problem solving theory, such as ‘goal setting’, ‘feedback’, ‘control processes’ and reformulation of ‘realistic goals’ (Watson & Tharp,

2006) had not yet been extensively researched in the context of worksite interventions for health care employees (chapter 2). The added value of a problem solving approach in worksite health promotion for health care employees is confirmed by the longitudinal study (chapter 6) that indicated that changes in work conditions and higher order goal facilitation are predictors of their well-being. Worksite interventions implemented by a problem solving approach generated more favorable determinants of quality of work than interventions without a systematic or another theoretical implementation approach. These findings led to the conclusion that problem solving interventions might be more effective for well-being too, besides for increasing quality of work than general well-being interventions. However, the results of the problem solving intervention study (chapter 5) indicated that no differences in well-being were found between health care employees in the problem solving intervention group and employees from the control group. Within the longitudinal study (chapter 6), changes in work conditions and higher order goal facilitation explained differences in well-being outcomes. The results of the longitudinal study and the evaluation study on problem solving interventions suggest several theoretical considerations.

Firstly, as was found in the review, problem solving interventions that proved to be effective in improving well-being outcomes in health care employees (Jones & Johnston, 2000; Mikkelsen et al., 2000), specifically focused on health care employees who received short stress management interventions. These health care employees are most likely to differ attitudinally from our sample consisting of health care employees that had been working in the health care sector since many years. Many health care employees reported to have lost their faith in promises of the management to improve their quality of work and well-being. The cycle of attitudinal actions, relapse and new attempts to improve well-being had taken place several times between these employees started to work and our intervention, years later. By then, many health care employees had entered a phase in which striving for improving well-being was no active goal anymore. In conclusion, one might say that expecting to improve quality of work and well-being outcomes of health care employees that have been working in the health care sector a long time ago might have been too optimistic. The results of the intervention as well as our experiences with this group of health care employees taught us more about the complexity of their working environment both from a quality of work and a well-being perspective. These findings are confirmed by Maslach, Schaufeli & Leiter's (2001) descriptive review of the literature on well-being interventions in a general and a health care employees population. In the review, Maslach and her colleagues conclude that improving well-being in health care employees might be an unrealistic intervention goal. They suggest that intervention goals for this health care population should be formulated in terms of engagement instead of burnout. Maslach further suggests that '*a focus on the positive goal of engagement may be necessary but not*

sufficient to motivate people to change their behaviour at the workplace' (Maslach, 2011, p. 50). Putting together these suggestions with the notion that work engagement in health care employees working in our research setting in general is considered to be problematically low (Geurts et al., 1998), helps to realize that interventions to improve well-being of these health care employees is extremely challenging.

A second core aspect of a problem solving approach is that specific personal intervention goals are relevant for the study of quality of work and well-being of employees in worksite health promotion programs. Since the studies showed promising results in this respect, a logical next step in future research would be to study the linkages between employees higher order goals and more concrete, midlevel goals. According to problem solving theory, improving quality of work and well-being will be significant to a group of employees (a) if they experience the intervention targets as an important problem, (b) if the employees receive clear feedback from their managers on the intervention process, and (c) if implementation process is controlled by a support and project group, whether the interventions are going according to the intervention plan.

7.4 Strengths and limitations

Strengths: what is the surplus value of this thesis?

The review in chapter two is one of the first reviews that examined effective intervention studies for health care employees from a theoretical perspective. An intervention based review within the context of worksite health promotion for health care employees has not been published before. Other reviews have attempted to distil important working mechanisms in worksite interventions, but were not based on solid theoretical frameworks, such as the JDCS model and a problem solving approach. Furthermore, our review did not only point at the possible importance of problem solving mechanisms, but also distinguished other intervention characteristics, such as the inclusion of participation of all levels of the health care organization in interventions, that moderate the effects of worksite interventions on quality of work and well-being outcomes of health care employees.

Secondly, to the best of our knowledge, the intervention described in this thesis is one of the first interventions that systematically applied a problem solving approach (D'Zurilla & Goldfield, 1971; Watson & Tharp, 2006). Other problem solving based interventions have been conducted in the context of worksite health promotion. These interventions, however, did not systematically take into account the various problem solving principles that are believed to facilitate goal achievement in all four phases of problem solving. Albeit an intervention, our problem solving intervention was the first to implement these theoretical implications into a practical worksite health

promotion intervention. Future studies could build on the results and experiences from this problem solving intervention and take into account the limitations that might have partly explained the lack of effect of our intervention.

A third strength of this study concerns the choice to develop an intervention for this challenging population (Michie & Williams, 2003; Leiter & Maslach, 2009). Having tried to improve quality of work and well-being for many years, many health care employees had given up hope on improvement of their working situation. Even though our intervention did not (yet) generate the results we expected or hoped for, the relevance of the problem solving intervention for this specific population was reflected in highly positive evaluations of the intervention by health care employees. Health care employees, but also managers and coordinating employees expressed great appreciation for the intervention and many health care employees indicated to have changed their work conditions and training possibilities, because of the intervention.

Limitations

The first limitation concerns the limited participation to the screening at T1 (chapter 4 and 5). The database of health care employees in the participating health care centers consisted of 3680 health care employees of which 1673 took part in the screening (T1, chapter 4). This 45.5 % was considerable, but the difference between the response of the intervention group (N=1034, 55.3%) and the control group (N=639, 35.5%) was significant, as the response of the control group was significantly lower (Chi-square = 81.65 (1); p-value < 0.000). This situation might have created a selection bias in the results of the screening. Because the participating employees in the control group might be more motivated and committed towards their work than the non-participating employees, they might be more positive about their work environment and feel healthier, which creates a positive selection bias on quality of work and well-being. Having in mind the response of the total research group, this relatively small sample of control health care employees clearly is an important methodological limitation of the screening study described in this thesis.

A second limitation concerned the high number of health care employees that dropped out of the study. Well-being interventions in general are known for their high drop-out rates and our study was no exception to this rule (Mikkelsen, Saksvik & Landsbergis, 2000). The evaluation article in chapter five and the longitudinal study in chapter 6 demonstrated a 3 year drop-out rate of 57.4 %. Of the 1673 participants from T1, 707 completed the questionnaire on the T2 (42.6%). Reasons for study drop-out were: turnover, absence of work, shift related reasons, personally related reasons or not feeling comfortable to belong to the control group. It may be obvious that the high turnover levels in the three year intervention period (about 15-20 % of the participants of the original sample could not be invited for T2) may

have influenced the effect of the intervention study. The large study power at baseline decreased and limited at least the possibility of detecting several organizational and well-being differences between intervention and control groups.

Thirdly, although the review is an important part and strength of this thesis, the small intervention groups that were used in the studies that are included in the review (chapter 2) are an important limitation. Only three studies, namely Bourbonnais et al. (2006), Heaney (1991), LeBlanc et al. (2007) included research groups with more than 100 respondents in the intervention and the control group. The analytic power of most of the studies in our review is therefore not strong enough. Having a relatively small sample of health care employees in many intervention studies clearly is an important methodological limitation of the studies described in our review. Besides the small intervention samples, ergonomic interventions were not included in our review, although these interventions might improve quality of work and well-being outcomes, e.g. somatic complaints.

A fourth limitation, with respect to generalizability of the results concerns the fact that men are underrepresented in the study sample (20% male vs. 80% female). Although equal representation of female and male health care employees would not be in line with epidemiological facts, the results of this thesis are predominantly based on female health care employees and results can not be generalized to other organizations or employee groups. In future research is would be advisable to study health and well-being of employees in other organizations and for men and women separately, since research suggests that gender differences are relevant in this respect (Bambra et al., 2007).

A final limitation of the studies in this thesis concerns the extensive use of self-report measures. Apart from the socio-demographics, such as age, years in health care sector, kind of shift and education , the studies in this thesis were predominantly based on self-report outcome measures. Critics of self-report measures point at the danger of response bias and decreased reliability and validity when assessing outcomes with self-report measures (Adams, Soumerai, Lomas and Ross-Degnan, 1999). Although not all the methodological downsides of self-report measures can be avoided, the use of questionnaires with sound psychometric properties helps to minimize chances of decreased reliability and validity. Most of the questionnaires used in this study were reliable and validated instruments that had been evaluated and tested in previous research.

7.5 Suggestions for future research

This thesis provided interesting data on the effects and relevance of a problem solving based intervention for worksite health promotion of health care employees, as well as ideas for future research. With respect to problem solving implications in worksite

interventions, further exploration of a problem solving approach for improving quality of work and well-being of health care employees is recommended. The results of the evaluation study indicate that a problem solving approach in improving quality of work of health care employees is worth the investigation. However, more research on a problem solving intervention for health care employees is needed to demonstrate its effect in practice. The problem solving intervention in this thesis was conducted as a evaluation study to explore and learn about practical implications on problem solving in quality of work of health care employees. Future studies could build on the results and experiences described in this thesis and deal with the limitations that might have influenced our results. The highly positive evaluation of the problem solving intervention for improving determinants of quality of work of health care employees indicated, that the application of problem solving theory in worksite interventions for health care employees is appreciated and should be further investigated. Besides, an exploration of problem solving interventions in other health care employee groups would be interesting. One might explore the role of a problem solving approach in younger or more recently started health care employees and compare the monitoring or characteristic components of problem solving aspects in different groups of health care employees or stages of life.

Secondly, the screening of health care employees' problem solving skills prior to an intervention should also be further investigated. Screening health care employees on problem solving skills might identify a group of health care employees that is not likely to benefit from a problem solving intervention. Maybe these health care employees would profit more from a stress management intervention or more externally regulated interventions than from problem solving interventions. Screening health care employees' problem solving skills prior to an intervention could therefore help to match health care employees to suitable interventions. The possibilities and effects of screening health care employees' problem solving skills should therefore be further examined.

In addition, it is advisable to use in the future national norms as a basis for this screening. The absence of an external reference or norm group may lead to over- or underestimation of problems within a specific health care center, department or unit. Although this norm group currently exists, these data were not available at the moment that the project was carried out.

Differences in target and approach between the three intervention centers could be better understood by means of process evaluation. As the necessary data for such an evaluation were not collected, it was impossible to explain if, how and why the process differed between the intervention centers. This is an important issue for further research.

Another issue concerns drop-out. While drop-out both in terms of turnover as well as in terms of non-participation was substantial, it would have been important to know more about the sources of or reasons for drop-out. As these data were lacking, it was not possible to carry out such an analysis. As a consequence, we think that this is an important issue for future research.

In addition, while analyses could only be carried out with subjects that remained in the study, it would have been important to compare at least at an institutional level the whole group of employees at T1 with the whole group at T2, including new personnel. So, in future longitudinal studies, new personnel should also be assessed.

Finally, personal goal facilitation at work is an important construct that should be further explored. Especially the mediating and/or moderating role between job characteristics, organizational and environmental characteristics on the one hand and distant outcomes such as turnover, absenteeism and burnout should be explored in future studies.

7.6 Conclusion

This thesis described the role of problem solving interventions in improving quality of work and well-being of health care employees. The promising results of a problem solving intervention as well as the strengths and limitations of it, point at the possible importance of problem solving research within the field of health care employees interventions. The study limitations that are described in the general discussion, however, also point at the need for careful interpretation of our study results. Therefore, more extensive research is needed to further understand the interventional and theory based mechanisms that underlie health care employees problem solving behaviors (Pomaki & Maes, 2002). There is still much more to know about the role of specific problem solving mechanisms in health care employees interventions. Implementing the results of this thesis in future problem solving studies in health care employees might bring the application of problem solving theory in the field of worksite health promotion up to a next level.

REFERENCES

Adams, A.S., Soumerai, S.B, Lomas, J. & Ross-Degnan, D. (1999). Evidence of self- report bias in assessing adherence to guidelines. *International Journal of Quality in Health Care*, **11**, 187-92.

Andrea, H., Bultmann, U., Van Amelsvoort, L. G. P. M., & Kant, Y. (2009). The incidence of anxiety and depression among employees--the role of psychosocial work characteristics. *Anxiety and Depression*, **26,** 1040–1048.

Akerboom, S. (1999). *The Organizational Risk Factor Questionnaire (ORFQ).* Cognitive Psychology, Leiden University, Leiden, The Netherlands.

Akerboom, S.P., & Maes, S. (2006). Beyond demand and control: The contribution of organizational risk factors in assessing the psychological well-being of health care employees. *Work & Stress*, **20**, 21-/36.

Arneson, H. & Ekberg, K. (2005). Evaluation of empowerment processes in a workplace health promotion intervention based on learning in Sweden. *Health Promotion International*, **20**, 351-359.

Arrindel, W.A. & Ettema, J.H.M. (1986). *Symptom Checklist-90, SCL-90, een multi-dimensionele psychopathologie-indicator, handleiding*. [Symptom Checklist-90, SCL-90 a multidimensional psychopathology indicator, manual]. Lisse: Swets Test Services.

Austin, J.T. & Vancouver, J.B. (1996). Goal Constructs in Psychology: Structure, Process, and Content. *Psychological Bulletin*, **120**, 338-375.

Bakker, A.B. & Demerouti, E. (2006). The Job Demands-Resources model: state of the art. *Journal of Managerial Psychology*, **22**, 309-328.

Bakker, A.B., Demerouti, E., De Boer, E., & Schaufeli, W.B. (2003). Job demands and job resources as predictors of absence duration and frequency. *Journal of Vocational Behavior*, **62,** 341–356.

Bakker, A. B., Demerouti, E., & Euwema, M.C. (2005). Job Resources Buffer the Impact of Job Demands on Burnout. *Journal of Occupational Health Psychology*, **10,** 170–180.

Bakker, A.B., Demerouti, E., & Verbeke, W. (2004). Using the Job Demands Resources model to predict burnout and performance. *Human Resource Management***, 43**, 83–104.

Bamberg, E. & Busch, C. (1996). Betriebliche Gesundheitsförderung durch Streßmanagementtraining: Eine Metaanalyse (quasi-)experimenteller Studien. *Zeitschrift für Arbeits- und Organisationspsychologie*, **40**, 127-137.

Bambra, C., Egan, M., Thomas, S., Petticrew, M. & Whitehead, M. (2007). The psychosocial and health effects of workplace reorganisation. 2. A systematic review of task restructuring Interventions. *Journal of Epidemiology & Community Health*, **61**, 1028–1037.

Bandura, A. (1989). Regulation of Cognitive Processes Through Perceived Self-Efficacy. *Developmental Psychology*, **25**, 729-735.

Barling, J., & Zacharatos, A. (2004). Human resource management and occupational safety. In J. Barling and M. Frone (Eds). *The psychology of workplace safety.* American Psychological Association: Washington, DC.

Barnett, R. C., & Brennan, R. T. (1995). The relationship between job experiences and psychological distress: A structural equation approach. *Journal of Organizational Behavior,* **16,** 259-276.

Bolhuis, P., Mandos, E., & Hollander, M. (2004). *Kwaliteit van arbeid in de gehandicaptenzorg. Medewerkers raadpleging.* Leiden: Research voor beleid.

Boumans, N. P.G., Berkhout, A.J.M.B., Vijgen, S.M.C., Nijhuis, F.J.N. & Vasse, R.M. (2008). The effects of integrated care on quality of work in nursing homes: A quasi-experiment. *International Journal of Nursing Studies*, **45,** 1122–1136.

Bourbonnais, R., Brisson, C. Vinet, A., Vézina, M. & Lower, A. (2006). Development and implementation of a participative intervention to improve the psychosocial work environment and mental health in an acute care hospital. *Occupational Environmental Medicine*, **63**, 326–334.

Boya, F.O., Demiral, Y., Ergor, A., Akvardar, Y. & De Witte, H. (2007). Effects of Perceived Job Insecurity on Perceived Anxiety and Depression in Nurses. *Industrial Health*, **46**, 613–619.

Brox, J. I. & Frøystein, O. (2005). Health-related quality of life and sickness absence in community nursing home employees: randomized controlled trial of physical exercise. *Occupational Medicine*, **55,** 558–563.

CBS Statline (2011). Ziekteverzuimpercentage; bedrijfstakken (SBI 1993) en bedrijfsgrootte. Retrieved from: http://statline.cbs.nl/StatWeb/publication/?DM=SLNL&PA=71737ned&D1=0&D2=0-4,10-13,17-18,21-22,25-28,32&D3=4,9,14,19,24,(l-5)-l&VW=T .

Chen, Y.M. , Chen, S.H. , Tsai, C.Y. & Lo, L.Y. (2007). Role stress and job satisfaction for nurse specialists. *Journal of Advanced Nursing,* **59**, 497–509.

Christiansen C. H., Backman, C., Little, B. R., & Nguyen, A. (1999). Occupations and well-being: A study of personal projects. *American Journal of Occupational Therapy*, **53**, 91-100.

Cohen-Katz, J., Wiley, S.D., Capuano, T., Baker, D.M. & Shapiro, S. (2005). The effects of mindfulness-based stress reduction on nurse stress and burnout, Part II: A quantitative and qualitative study. *Holistic Nursing Practice*, **19**, 27-35.

Cox, T., & Cox, S. (1993). *Psychosocial and Organizational Hazards: Monitoring and Control*. Occasional Series in Occupational Health, No.5. World Health Organization (Europe), Copenhagen, Denmark.

Curtis, K.A. (1992). Altering beliefs about the importance of strategy: an attributional Intervention. *Journal of Applied Social Psychoogy*, **22,** 953–972.

Daniels, K. & Guppy, A. (1994). Occupational Stress, Social Support, Job Control, and Psychological Well-being. *Human Relations,* **47**, 1523-1544.

De Jonge, J., Mulder, M. J. G. P., & Nijhuis, F. J. N. (1999). The incorporation of different demand concepts in the job demand-control model: Effects on health care professionals. *Social Science and Medicine,* **48***,* 1149–1160.

De Lange, A.H., Taris, T.W., Kompier, M.A.J., Houtman, I.L.D. & Bongers, P.M. (2002). The effects of stable and changing demand-control histories on worker health: Results of the longitudinal SMASH study. *Scandinavian Journal of Work, Environment, and Health*, **28**, 94-108.

De Lange, A.H., Taris, T., Kompier, M.A.J., Houtman, I.L.D. & Bongers, P.M. (2003). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-wave study. *Work & Stress*, **18**, 149-166.

Delvaux, N., Razavi, D., Marchal, S., Brédart, A., Farvacques, C. & Slachmuylder, J.L. (2004). Effects of a 105 hours psychological training program on attitudes, communication skills and occupational stress in oncology: a randomised study. *British Journal of Cancer*, **90**, 106 – 114.

Demerouti, E., Bakker, A.B., Nachreiner, F. & Schaufeli, W.B. (2001). The Job Demands-Resources Model of Burnout. *Journal of Applied Psychology*, **86,** 499-512.

Derogatis, L.R. (1983). *SCL-90-R: Administration, Scoring & Procedures Manual-II* (2nd ed.). Baltimore: Clinical Psychometric Research.

D'Zurilla, T. J. (1986). *Problem-solving therapy: a social competence approach to clinical intervention*. New York: Springer.

D'Zurilla, T.J. & Goldfried, M.R. (1971). Problem solving and behaviour modification. *Journal of Abnormal Psychology*, **78,** 107-126.

D'Zurilla, T.J., Nezu, A. M. & Maydeu-Olivares, A. (2004). Social problem solving: Theory and assessment. In E.C. Chang, T.J. D'Zurilla & L. Sanna, (Eds.) *Social problem solving: Theory, research, and training* (11-27). Washington, DC: American Psychological Association.

D'Zurilla, T. J., & Nezu, A. M. (1982). Social problem-solving in adults. In P. C. Kendall, *Advances in cognitive-behavioral research and therapy*, **1**, 201-274. New York: Academic Press.

Elovainio, M., & Kivimaki, M. (1996). Occupational stresses, goal clarity, control, and strain among nurses in the Finnish health care system. *Research in Nursing and Health,* **19***,* 517-524.

Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology,* **51,** 1058-1068.

Emmons, R. A. (1989). The personal striving approach to personality. In L. A. Pervin (Ed.), *Goal concepts in personality and social psychology* (pp. 87-126). Hillsdale, NJ : Erlbaum.

Emmons, R.A. (1997). *Personal goals and the meaning-making process*. Presented at a Division 32 symposium entitled "Personal Meaning: Research and Theory" at the Annual Convention of the American Psychological Association, Chicago, Illinois.

Engbers, L. (2007). *Monitoring and Evaluation of Worksite Health Promotion Programs – Current state of knowledge and implications for practice.* Background paper prepared for the WHO/WEF Joint Event on Preventing Noncommunicable Diseases in the Workplace. Geneva: WHO Press.

Ford, M.E. (1992). *Human Motivation: Goals, Emotions, and Personal Agency Beliefs*. Newbury Park, CA: Sage.

Frese, M. & Zapf, D. (1994). Action as a core of work psychology; a German approach. In H.C. Triandis, M.D. Dunnette & L.M. Hough (Eds.), *Handbook of Industrial and Organizational Psychology* (pp. 271-340). Palo Alto, CA: Consulting Psychologists Press.

Furda, J., de Jonge, J., Le Blanc, P., Meijman, T., Schreurs, P., & Scheenen, J. (1994). Het Demand-control support model in relatie tot gezondheidsklachten en herstelklachten. *Gedrag en Organisatie,* **7,** 269-287.

Ganster, D.C., Schaubroeck, J. (1991). Work Stress and Employee Health. *Journal of Management***, 17, 235-271**.

Gardiner, M., Lovell, G. & Williamsom, P. (2004). Physician you can heal yourself! Cognitive behavioural training reduces stress in GPs. *Family Practice,* **21**, 545-551.

Gardner, B., Rose, D.J., Mason, O. Tyler, P. & Cushway, D. (2005). Cognitive therapy and behavioural coping in the management of work-related stress: An intervention study. *Work & Stress*, **19**, 137-152.

Gelsema, T.I., Van Der Doef, M., Maes, S., Janssen, M., Akerboom, S. & Verhoeven C. 2006. A longitudinal Study of Job Stress in the Nursing Profession: Causes and Consequences. *Journal of Nursing Management,* 14, 289-299.

Geurts, S.A.E., Schaufeli, W.B., & Jonge, J. de (1998). Burnout and intention to leave among mental health-care professionals: A social psychological approach. *Journal of Social and Clinical Psychology*, *17*(3), 341-362.

Gochman, D.S. (Ed.) (1997). *Handbook of Health Behavior Research.* New York, Vol. 1–4: Plenum.

Golembiewski, R. T., Hilles, R., & Daly, R. (1987). Some effects of multiple OD interventions on burnout and worksite features. *The Journal of Applied Behavioral Science,* **23**, 295-313.

Gollwitzer, P. M., & Bargh, J. A. (Eds.) (1996). *The psychology of action: Linking cognition and motivation to behavior.* New York: Guilford Press.

Gollwitzer, P. M., & Moskowitz, G. B.(1996). Goal effects on action and cognition. In E. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 361-399). New York: Guilford Press.

Hamberg-van Reenen, H.H., Prober, K.I. & Van den Berg, M. (2012). Worksite mental health interventions: a systematic review of economic evaluations. *Occupational and Environmental Medicine*, **69**, 837-845.

Harris, C., Daniels, K. & Briner, R.B. (2003). A daily diary study of goals and affective well-being at work. *Journal of Occupational and Organizational Psychology*, **76**, 401-410.

Häusser, J. A., Mojzisch, A., Niesel, M. & Schulz-Hardt, S. (2010). Ten years on: A review of recent research on the Job Demand-Control (-Support) Model and psychological well-being. *Work & Stress,* **24,** 1-35.

Heaney, C. A. (1991). Enhancing Social Support at the Workplace: Assessing the Effects of the Caregiver support program. *Health Education and Behavior,* **18,** 477-494.

Heaney, C. A., Price, R. H., & Rafferty, J. (1995). Increasing coping resources at work: A Field Experiment to Increase Social Support, Improve Work Team Functioning, and Enhance Employee Mental Health. *Journal of Organizational Behavior*, **16**, 335-352.

Hudson, P.T.W., Zieverink, H.J.A., Groeneweg, J., Akerboom, S.P., Wagenaar, W.A., & Reason, J.T. (1995). *Fixing Tripod Delta.* Report for Shell International Petroleum, The Hague.

Hugenholtz, N.I.R., Schaafsma, F.G., Nieuwenhuijsen, K. & Van Dijk, F.J.H. (2008). Effect of an EBM course in combination with case method learning sessions: an RCT on professional performance, job satisfaction, and self-efficacy of occupational physicians. *International Archives of Occupational and Environmental Health*, **82**, 107–115.

Hyvönen, K., Feldt, T., Tolvanen, A. & Kinnunen, U. (2010). The role of goal pursuit in the interaction between psychosocial work environment and occupational well-being. *Journal of Vocational Behavior*, **76**, 406-418.

Hyvönen, K., Feldt, T., Salmela-Aro, K., Kinnunen, U. & Mäkikangas, A. (2009). Young managers' drive to thrive: A personal work goal approach to burnout and work engagement. *Journal of Vocational Behavior*, **75**, 183-196.

Ingersoll-Dayton, B., Morgan, D., & Antonucci, T. (1997). The effects of positive and negative social exchanges on aging adults. *Journal of Gerontology: Social Sciences*, **52B**, 190-199.

Innstrand, S. T., Espnes, G. A., & Mykletun, R. (2004). Job stress, burnout and job satisfaction: An intervention Study for staff working with people with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, **17,** 19-126.

Israel, B.A., Baker, E.A., Goldenhar, L.M., Heaney, C.A. & Schurman, S.J. (1996). Occupational Stress, Safety, and Health: Conceptual Framework and Principles for Effective Prevention Interventions. *Journal of Occupational Health Psychology*, **1,** 261-286.

Jaffe, A. B, Peterson, S. R., & Portney, P. R. (1995). Environmental regulation and the competitiveness of U.S. manufacturing: What does the evidence tell us? *Journal of Economic Literature*, **13,** 132-163.

Johnson, J. V., & Hall, E. M. (1988). Job strain, work place social support, and cardiovascular disease: a cross-sectional study of a random sample of the Swedish working population. *American Journal of Public Health,* **78,** 1336-1342.

Johnson, J. V., Hall, E. M., Ford, D. E., Mead, L. A., Levine, D. M., Wang, N. Y. & Klag, M. J. (1995). The psychosocial work environment of physicians: The impact of demands and resources on job dissatisfaction and psychiatric distress in a longitudinal study of Johns Hopkins Medical School graduates. *Journal of Occupational and Environmental Medicine,* **37,** 1151-1159.

Johnson J. V., Hall E. M., & Theorell T. (1989). Combined effects of job strain and social isolation on cardiovascular disease morbidity and mortality in a random sample of the Swedish male working population. *Scandinavian Journal of Work, Environment & Health,* **15,** 271-279.

Jones, M.C. & Johnston, D.W. (2000). Evaluating the impact of a worksite stress management programme for distressed student nurses: a randomised controlled trial. *Psychology & Health*, **15**, 689-706.

Kahn, E.B., Ramsey, L.T., Brownson, R.C., Heath, G.W., Howze, E.H., Powell, K.E., Stone, E.J., Rajab, M.W. & Corso P. (2002). The effectiveness of interventions to increase physical activity. A systematic review. *American Journal of Preventive Medicine*, **22,** 73-107.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, **24,** 285-308.

Karasek, R. A. (1985). *Job Content Questionnaire and user's guide.* Lowell: University of Massachusetts Lowell, Department of Work Environment.

Karasek, R. A., & Theorell, T. (1990). *Healthy work: stress, productivity, and the reconstruction of the working life*. New York: Basic Books.

Kehr, H. M. (2003). Goal conflicts, attainment of new goals, and well being among managers. *Journal of Occupational Health Psychology*, **8**, 195–208.

Kelly, M.L., Scott, W.O.M., Prue, D.M. & Rychtarik, R.G. (1985). A component analysis of problem-solving skills training. *Cognitive Therapy and Research*, **9**, 429-441.

Keyes, J. B., & Dean, S. F. (1988). Stress inoculation training for direct contact staff working with mentally retarded persons. *Behavioral Residential Treatment*, **3**, 315-323.

Kristensen, T. S. (1995). The demand-control-support model: Methodological challenges for future research. *Stress Medicine,* **11**, 17-26.

Krugman, M., & Preheim, G., (1999). Longitudinal Evaluation of Professional Nursing Practice Redesign. *Journal of Nursing Administration*, **29,** 10-20.

Kuske, B., Luck, T., Hanns, S., Matschinger, H., Angermeyer, M.C., Behrens, J. & Riedel-Heller, S.G. (2009). Training in dementia care: a cluster-randomized controlled trial of a training program for nursing home staff in Germany. *International Psychogeriatrics,* **21**, 295–308.

Kushnir, T., Malkinson, R. & Ribak, J. (1994). Teaching stress management skills to occupational and environmental health physicians and practitioners. *Journal of Occupational Medicine*, **36,** 1335–1340.

Landsbergis P. A., Schnall P. L., Dietz D., Friedman R., Pickering T G. (1992). The patterning of psychological attributes and distress by job strain and social support in a sample of working men. *Journal of Behavioral Medicine,* **15,** 379-405.

Lavoie-Tremblay, M. (2004). Creating a Healthy Workplace. A Participatory Organizational Intervention. *Journal of Nursing Administration*, **34**, 469-474.

Lavoie-Tremblay, M., Bourbonnais, R., Viens, C., Ve´zina, M., Durand, J.P., & Rochette, L. (2005). Improving the psychosocial work environment, *Journal of Advanced Nursing,* **49**, 655–664.

Le Blanc, P.M., Hox, J.J., Schaufeli, W.B., Taris, T.W. & Peeters, M.C. (2007). Take Care! The Evaluation of a Team-Based Burnout Intervention Program for Oncology Care Providers. *Journal of Applied Psychology*, **92,** 213–227.

Lee, S. & Swanson Crockett, M. (1994). Effect of Assertiveness Training on Levels of Stress and Assertiveness Experied by Nurses in Taiwan, Republic of China. *Issues in Mental Health Nursing,* **15,** 419-432.

Leiter, M.P. & Maslach, C. (2009). Nurse turnover: the mediating role of burnout. *Journal of Nursing Management*, **17**, 331-339.

Leventhal, H. & Mora, P.A. (2005). Is there a Science of the Processes Underlying Health and Illness Behaviors? A Comment on Maes and Karoly. *Applied Psychology: an international review*, **54**, 255 –266.

Li, C.Y. & Sung, F.C. (1999). A review of the healthy worker effect in occupational epidemiology. *Occupational Medicine,* **49**, 225-229.

Lim, S. Y. & Murphy, L. R., (1999). The relationship of organizational factors to employee health and overall effectiveness. *American Journal of Industrial Medicine*, **36**, 1, 64-65.

Lindström, K. (1994). Psychosocial criteria for good work organization. *Scandinavian Journal of Work, Environment & Health,* **20**, 123-133.

Lindström, K., Schrey, K., Ahonen, G. & Kaleva, S. (2000). The Effects of Promoting Organizational Health and Worker Well-Being and Organizational Effectiveness in Small and Medium-Sized Entreprises. In Murphy, R. & Cooper, C.: *Healthy and productive Work*. Taylor and Francis. London.

Locke, E. A., & Latham, G. P. (1990). *A theory of goal setting and task performance.* Englewood Cliffs, NJ: Prentice Hall.

Locke, E.A. & Latham, G.P. (1994). Goal setting theory. In O'Neil, H. F. & Drillings, M. (Eds.), *Motivation: Theory and research* (pp. 13-29). Hillsdale, NJ: Lawrence Erlbaum Associates.

Locke, E.A. & Latham, G.P., (2002). Building a Practically Useful Theory of Goal Setting and Task Motivation. A 35-Year Odyssey. *American Psychologist,* **57**, 705–717.

Lokk, C.T.J. & Arnetz, B.B. (2000). Impact of Management Change and an Intervention Program on Health Care Personnel. *Psychotherapy and Psychosomatics*, **69**, 79–85.

Maes, S. & Karoly, P. (2005). Self-Regulation Assessment and Intervention in Physical Health and Illness: A Review. *Applied Psychology,* **54**, 267-299.

Maes, S., & Van der Doef, M. (2004). Worksite health promotion. In: A. Kaptein & J. Weinman (Eds.). *Health psychology* (pp. 358-383). Oxford, England: Blackwell.

Maes, S., Van der Doef, M. & Verhoeven, C. (1993) *Leidse Arbeids Kwaliteit Schaal (LAKS)* [Leiden Quality of Work Questionnaire (LQWQ)]. Leiden: Health Psychology, Leiden Univerity.

Marshall, N. L., Barnett, R. C., & Sayer, A. (1997). The changing workforce, job stress, and psychological distress. *Journal of Occupational Health Psychology,* **2**, 99–107.

Maslach, C. (2011). Engagement research: Some thoughts from a burnout perspective. *European Journal of Work and Organizational Psychology*, **20**, 47-52.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *The Maslach Burnout Inventory (3rd ed.).* Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Schaufeli, W.B. & Leiter, M.P. (2001). Job Burnout. *Annual Review of Psychology*, **52**, 397-422.

Michie, S. & Williams, S. (2003). Reducing work related psychological ill health and sickness absence: a systematic literature review. Occupational Environmental Medicine, **60**, 3–9.

Mikkelsen, A., Saksvik, P.O. & Landsbergis, P. (2000). The impact of a participatory organizational intervention on job stress in community health care institutions. *Work & Stress,* **14**, 156–170.

Morgan, G.A., Leech, N.L., Gloeckner, G.W. & Barrett, K.C. (2004). *SPSS for introductory statistics.* Mahwah: Erlbaum Associates.

Murphy, L.R. (1984). Stress management in highway maintenance workers. *Journal of Occupational Medicine*, **26**, 436–442.

Murphy, R.K. (1996). Stress management in work settings: A critical review of the health effects. *American Journal of Health Promotion*, **11**, 112-135.

Nezu, C. M., Palmatier, A., & Nezu, A. M. (2004). Social problem-solving training for caregivers. In E. C. Chang, T. J. D'Zurilla, & L. J. Sanna (Eds.), *Social problem solving: Theory, research, and training* (pp. 223-238). Washington, DC: APA.

Paris, M. & Hoge, M.A. (2009). Burnout in the Mental Health Workforce: A Review. *Journal of Behavioral Health Services & Research*, **37**, 519-528.

Parker, P. A., & Kulik, J. A. (1995). Burnout, self and supervisor-related job performance, and absenteeism among nurses. *Journal of Behavioral Medicine*, **18**, 581–599.

Parker, S. K., Wall, T. D., & Cordery, J. L. (2001). Future work design research and practice: Towards an elaborated model of work design. *Journal of Occupational and Organizational Psychology*, **74**, 413-440.

Pervin, L. A. (1989). *Personality: Theory and research* (5th ed.). New York: Wiley.

Petterson, I.L. & Arnetz B.B. (1998). Psychosocial stressors and well-being in health care workers. The impact of an intervention program. *Social Science & Medicine*, **47**, 1763-1772.

Petterson, I. L., Donnersvard, H. A., Lagerstrom, M. & Toomingas, A. (2006). Evaluation of an intervention programme based on empowerment for eldercare nursing staff. *Work & Stress*, **20**, 353-369.

Pisanti, R., Van der Doef, M., Maes, S., Lazzari, D., & Bertini, M. (2011). Job characteristics, organizational conditions, and distress/well-being among Italian and Dutch nurses: A cross-national comparison. *International Journal of Nursing Studies*, **48**, 829-837.

Pomaki, G. & Maes, S. (2002). Predicting quality of work life: from work conditions to self-regulation. In: Gullone, E. & Cummins, R.A. (Eds.), *The universality of subjective wellbeing indicators. A multi-disciplinary and multi-national perspective.* **16**, 151-173. Kluwer Academic Publishers.

Pomaki, G., Maes, S. & Ter Doest, L.T. (2004). Work conditions and employees' self-set goals: goal processes enhance prediction of psychological distress and well-being. *Personality and Social Psychology Bulletin*, **6**, 685-694.

Pomaki, G., Supeli, A. & Verhoeven, C. (2007). Role conflict and health behaviors: Moderating effects on psychological distress and somatic complaints. *Psychology and Health*, **22**, 317–335.

Pousette, A. & Hanse, J.J. (2002). Job characteristics as predictors of ill-health and sickness absenteeism in different occupational types – a multigroup structural equation modelling approach. *Work & Stress*, **16**, 229-250.

Pryce, J ., Albertsen, K. & Nielsen, K. (2006). Evaluation of an open-rota system in a Danish psychiatric hospital: a mechanism for improving job satisfaction and work–life balance. *Journal of Nursing Management*, **14**, 282–288.

Rijk, A.E. de, Le Blanc, P.M., Schaufeli, W.B. & De Jonge, J. (1998). Active coping and need for control as moderators of the job demand-control model: Effects on burnout. *Journal of Occupational and Organizational Psychology,* **71**, 1-18.

Roberts, K.H., Cerutti, N.L. & O'Reilly, C.A. (1976). Changing perceptions of organizational communication: can short-term intervention help? *Nurs Research,* **25**, 197-200.

Roe, R.A. (2008). Time in Applied Psychology. The Study of "What Happens" Rather Than "What Is". *European Psychologist,* **13**, 37–52.

Rosse, J.G. & Rosse, P.H. (1981). Role Conflict and Ambiguity: An Empirical Investigation of Nursing Personell. *Evaluations & the Health Professions,* **4**, 385-405.

Schabracq, M.J. (2003). Everyday well-being and stress in work and organizations. In M.J. Schabracq, J.A.M. Winnubst, & C.L. Cooper (Eds.), *The handbook of Work and Health Psychology* (pp. 9-36). Chichester: John Wiley & Sons, Ltd.

Sauter, S., Lim, S. Y., & Murphy, L. R. (1996). Organizational Health: A New Paradigm for Occupational Stress at NIOSH. *Japanese Journal of Occupational Mental Health,* **4**, 248-254.

Schaufeli, W. B., Bakker A. B. & Van Rhenen W. (2009). How changes in job demands and resources predict burnout, work engagement and sickness absenteeism. Journal of Organizational Behavior, **30**, 893-917.

Schaufeli, W.B. & Van Dierendonck, D. (2000). UBOS. *Utrechte Burnout Schaal, handleiding*. Lisse, Swets Test Publishers.

Schurman, S. & Israel, B. (Redesigning Work Systems to Reduce Stress: A Participatory Action Research Approach to Creating Change in Murphy R.L. Hurrell, J.J., Sauter, S.L. & Puryear Keita, G. (1995). *Job Stress Interventions*, APA.

Semmer, N., Zapf, D., & Dunckel, H. (1995). Assessing stress at work: a framework and an instrument. In O. Svane & Ch. Johansen (Eds.), *Work and Health-Scientific Basis of Progress in the Working Environment* (pp. 105-113). Luxembourg: Office for Official Publications of the European Communities.

Shoaf, C., Genaidy, A., Karwowski, W. & Huang, S.H. (2004). Improving Performance and Quality of Working Life: A Model for Organizational Health Assessment in Emerging Enterprises. *Human Factors in Ergonomics ergonomics, the engineering science concerned with the physical and psychological relationship between machines and the people who use them. The ergonomicist takes an empirical approach to the study of human-machine interactions. & Manufacturing Archive*, **14**, 81-95.

Sundin, L., Hochwälder, J., & Lisspers, J. (2011). A longitudinal examination of generic and occupational specific job demands, and work-related social support associated with burnout among nurses in Sweden. *Work,* **38***,* 389-400.

Taris, T.W., Kompier, M.A.J., de Lange, A.H., Schaufeli, W.B. & Scheurs, P.J.G. (2003). Bevordert het werk het Ieren van leraren? Een longitudinale toets van de actief leren- hypothese in Karaseks Demand-Control-model. *Gedrag en Organisatie*, **16**, 142-168.

Taylor, S., White, B. & Muncer, S. (1999). Nurses' cognitive structural models of work-based stress. *Journal of Advanced Nursing*, **29**, 974-983.

Terborg, J.R. (1998). Health Psychology in the United States: A Critique and Selected Review. *Applied Psychology: An International Review*, **47**, 199-217.

Ter Doest, L.T., Maes, S. Gebhardt, W.A. & Koelewijn, H. (2006). Personal goal facilitation through work: Implications for employee satisfaction and well-being. *Applied Psychology: An International Review*, **55**, 192-219.

Theorell, T. & Karasek R. (1996). Current issues relating to psychosocial job strain and cardiovascular disease research. *Journal of Occupational Health Psychology.* **1**, 9-26.

Tummers, G.E.R., Landeweerd, J.A. & Merode, G.G. van (2002). Work organisation, work characteristics and the psychological effects on nurses in the Netherlands. *International Journal of Stress Management,* **9**, 183-206.

Tveito, T.H. & Eriksen, H.R. (2008). Integrated health programme: a workplace randomized controlled trial. *Journal of Advanced Nursing*, **65**, 110–119.

Van der Doef, M. (2000). *The Job Demand-Control(-Support) model: from the past to the future.* Universiteit Leiden, 134pp. (Leiden, Universiteit Leiden) S. Maes. (dissertatie).

Van der Doef, M., & Maes, S. (1998). The Job Demand-Control(-Support) model and physical health outcomes: A review of the strain and buffer hypotheses. *Psychology & Health,* **13**, 909-936.

Van der Doef, M., & Maes, S. (1999a). The job demand-control-support model and psychological well-being: A review of 20 years of empirical research. *Work and Stress,* **13**, 87-114.

Van der Doef, M. & Maes, S. (1999b). The Leiden Quality of Work Questionnaire: Its construction, factor structure, and psychometric qualities. *Psychological Reports,* **85**, 954-962.

Van der Doef, M., Maes, S., & Diekstra, R. (2000). An examination of the job-demand-control-support model with various occupational strain indicators. *Anxiety Stress and Coping,* **13**, 165-185.

Van Dierendonck, D., Schaufeli, W.B. & Buunk, B.P. (1998). The Evaluation of an Individual Burnout Intervention Program: The Role of Inequity and Social Support. *Journal of Applied Psychology,* **83**, 392-407.

Van Wyk, B.E. & Pillay-Van Wyk, V. (2010). Preventive staff-support interventions for health care workers (Review). *The Cochrane Library,* **3**.

Visser, M.R.M., Smets, E.M.A., Oort, F.J., & De Haes, H.C.J.M. (2003). Stress, satisfaction and burnout among Dutch medical specialists. *Canadian Medical Association Journal*, **168**, 271–5.

Von Baeyer, C.L. , & Krause, L. (1983). Effectiveness of stress management training for nurses working in a burn treatment unit. *International Journal of Psychiatry in Medicine,* **13**, 113-126.

Wagenaar, W.A., Groeneweg, J., Hudson, P.T.W. & Reason, J.T. (1994). Safety in the oil industry. *Ergonomics,* **37**, 1999-2013.

Wagenaar, W. A., Hudson, P. T. W. & Reason, J. T. (1990). Cognitive failures and accidents. *Applied Cognitive Psychology*, **4**, 273–294.

Wagenaar, W.A. & Schrier, J.H. van der, (1997). Accident analysis. The goal and how to get there. *Safety Science,* **26**, 25-33.

Watson, D. L., & Tharp, R. G. (2006). *Self-directed behavior* (9th ed.). Belmont, CA: Wadsworth.

Wegner, D. M., & Pennebaker, J. W. (Eds.) (1993). *Handbook of mental control.* Englewood Cliffs, NJ: Prentice-Hall.

Ziegenfuss, J.T. (2002). *Organization and Management Problem Solving: A Systems and Consulting Approach*. CA: Sage Publications Ltd.

APPENDIX

APPENDIX I: Socio demographic variables

Socio demographic variables from employees of the experimental group were compared to the control group. Frequencies and percentages were presented for the variables gender, age, marital status, years in sector, years in health care center, work hours per week, kind of shift and highest educational level.

Socio-, demographic variables	Exp. Group (N=461) N / %		Ctr. Group (N=241) N / %		Chi-square P-value
Gender					.450
Male	89	19.3%	51	20.7%	
Female	372	80.7%	195	79.3%	
Age					.720
18 to 35 years	193	41.9%	105	42.7%	
36 to 52 years	248	53.8%	132	53.7%	
52 to 65 years	20	4.3%	9	3.7%	
Marital Status					.083
Married/Living together	342	74.2%	183	74.4%	
Divorced	17	3.7%	12	4.9%	
Widow(er)	5	1.1%	1	0.4%	
Single	97	21.0%	50	20.3%	
Years in sector					.037*
0 to 5 years	219	47.5%	127	51.6%	
6 to 10 years	134	29.1%	57	23.2%	
11 to 20 years	86	18.7%	46	18.7%	
21 years or longer	22	4.8%	13	5.3%	
Years in Health Care Center					.002**
0 to 5 years	184	39.9%	110	44.7%	
6 to 10 years	137	29.7%	55	22.4%	
11 to 20 years	108	23.4%	63	25.6%	
21 years or longer	32	6.9%	17	6.9%	
Work hours per week					.154
0 to 12 hours	37	8.0%	26	10.6%	
13 to 24 hours	148	32.1%	73	29.7%	
25 or more hours	276	59.9%	146	59.3%	

Socio-, demographic variables	Exp. Group (N=461) N / %		Ctr. Group (N=241) N / %		Chi-square P-value
Shift					.000***
Day shift	169	36.7%	114	46.3%	
Flexible shifts	292	63.3%	128	52.0%	
Education					.000***
High school third level	38	8.2%	19	7.7%	
High school secondary level	35	7.6%	12	4.9%	
High school highest level	28	6.1%	17	6.9%	
Secondary vocational	217	47.1%	93	37.8%	
College	128	27.8%	91	37.0%	
University	15	3.3%	6	2.4%	

**p= sign at α<.05, ** p= sign at α <.01, *** p= sign at α <.001*

APPENDIX II: Representativity of the research sample

Representativity of the research sample from data from employees at that participated only at T1 compared to data from employees that completed the questionnaire at T1 and T2. Frequencies for the socio demographic variables gender, age, marital status, function, years on department, years in health care center, work hours per week, shift and education. And averages of dependent and independent variables: time and work pressure, skill discretion, decision authority, task control, social support from supervisor, social support from coworkers, role ambiguity, job insecurity, communication, training opportunities, higher order goals, job satisfaction, emotional exhaustion, depersonalization and personal competence.

	T1 (N=977)		T1+T2 (N=707)		Chi-square		T1 (N=977)	T1+T2 (N=707)	T-test
Socio-, demographic variables	**N**	**%**	**N**	**%**	**P-value**	**Work conditions, ORFs and well-being outcomes**	**Mean (sd)**	**Mean (sd)**	**P-value**
Gender					.960	Time/work pressure	2.71(.53)	2.68 (50)	.190
Male	194	19.9%	140	19.8%		Skill Discretion	2.99 (.36)	3.01(.38)	.091
Female	782	80.0%	567	80.2%		Decision Authority	2.95 (.43)	3.03 (.45)	.000***
Age					.000***	Task control	2.64 (.48)	2.67 (.45)	.072
18 to 35 years	541	55.4%	298	42.1%		Social support supervisor	2.79 (.56)	2.86 (.51)	.000***
36 to 52 years	391	40.0%	380	53.7%		Soc. support co-workers	3.08 (.40)	3.10 (.37)	.096
52 to 65 years	44	4.5%	29	4.1%		Role ambiguity	2.15 (.41)	2.13 (.38)	.048
Marital Status					.015*	Job insecurity	1.90 (.62)	1.78 (.57)	.000***
Married/Living together	679	69.5%	525	74.3%		Communication	37.46 (27.97)	36.00 (27.09)	.242
Divorced	35	3.6%	29	4.1%		Training opportunities	54.66 (33.62)	51.37 (32.73)	.030*
Widow(er)	6	0.6%	6	0.8%		Higher order goal facilitation	9.89 (1.89)	10.02 (1.82)	.026*
Single	253	25.9%	147	20.8%		Job satisfaction	2.81(.52)	2.90 (.45)	.000***
Function					.000***	Emotional Exhaustion	3.01 (1.03)	2.86 (.92)	.000***
Management	41	4.2%	36	5.1%		Depersonalization	2.06 (.77)	2.05 (.75)	.617
Work floor	246	25.2%	242	34.2%		Personal Competence	5.07 (.60)	5.12 (.59)	.011*
Staff	25	2.9%	28	4.0%					
Assisting	102	10.4%	56	7.9%					
Coordinator	106	10.8%	69	9.8%					
Housekeeping	50	5.1%	30	4.2%					
Years in sector					.000***				
0 to 5 years	582	59.6%	346	48.9%					
6 to 10 years	205	21.0%	191	27.0%					
11 to 20 years	148	15.1%	132	18.7%					
21 years or longer	33	3.4%	35	5.0%					

	T1 (N=977)		T1+T2 (N=707)		Chi-square		T1 (N=977)	T1+T2 (N=707)	T-test
Socio-, demographic variables	**N**	**%**	**N**	**%**	**P-value**	**Work conditions, ORFs and well-being outcomes**	**Mean (sd)**	**Mean (sd)**	**P-value**
Years in Health Care Center					.000***				
0 to 5 years	523	53.5%	294	41.6%					
6 to 10 years	214	21.9%	192	27.2%					
11 to 20 years	197	20.2%	171	24.2%					
21 years or longer	40	4.1%	49	6.9%					
Work hours per week					.001**				
0 to 12 hours	128	13.1%	63	8.9%					
13 to 24 hours	261	26.7%	221	31.3%					
25 or more hours	582	59.6%	422	59.7%					
Shift					.000***				
Day shift	310	31.7%	283	40.0%					
Flexible shifts	661	67.7%	420	59.4%					
Education					.165				
High school third level	75	7.7%	57	8.1%					
High school secundary level	69	7.1%	47	6.6%					
Secundary vocational	452	46.3%	310	43.8%					
High school highest level	65	6.7%	45	6.4%					
College	290	29.7%	219	31.0%					
University	17	1.7%	21	3.0%					

*p= sign at α<.1, *p= sign at α<.05, ** p= sign at α <.01, *** p= sign at α <.001*

APPENDIX III: Questionnaire WWW project

Work conditions:
4-puntsschaal: 1=volledig mee oneens; 4=volledig mee eens.

Skill discretion
Mijn werk vereist dat ik nieuwe dingen leer
In mijn werk komen vaak dezelfde werkzaamheden terug
Mijn werk vereist dat ik creatief ben
Mijn werk vereist een hoge mate van vakkundigheid
Ik krijg op mijn werk veel verschillende dingen te doen
Ik heb op mijn werk de gelegenheid mij verder te bekwamen
Ik heb veel verantwoordelijkheid op mijn werk
Mijn werk is saai en eentonig

Desicion Authority
Ik moet voortdurend uitvoeren wat anderen mij opdragen
Mijn werk biedt me de ruimte veel beslissingen zelf te nemen
Ik heb in mijn baan heel weinig vrijheid om te beslissen hoe ik mijn werk doe
Ik heb veel inspraak in wat er op mijn werk gebeurt

Task Control
Ik kan zelf het tempo bepalen waarin ik werk
Ik kan zelf de volgorde van mijn werk bepalen
Ik kan als ik dat wil mijn werkplek even verlaten
Ik kan tijdens mijn werk een praatje maken

Time and work pressure
Mijn werk vereist dat ik erg snel werk
Mijn werk vereist dat ik erg hard werk
Ik hoef niet overdreven veel werk te doen
Ik heb voldoende tijd om mijn werk af te krijgen

Role Ambiguity
Ik krijg geen tegenstrijdige opdrachten
Ik weet precies wat anderen op mijn werk van mij verwachten
Ik weet precies waarvoor ik verantwoordelijk ben
Ik weet precies hoe mijn leidinggevende over mijn prestaties denkt
Ik weet precies hoe collega's over mijn prestaties denken
Ik weet precies wat mijn taken zijn

Physical exertion
Mijn baan vereist veel lichamelijke inspanning
Ik moet op mijn werk vaak zware lasten tillen of verplaatsen
Ik moet vaak langere tijd in een ongemakkelijke houding werken

Job Insecurity
Ik ben zeker van mijn baan
In het afgelopen jaar liep ik de kans mijn baan te verliezen
Ik verwacht dat ik in de komende vijf jaar mijn baan zal verliezen

Social Support from Supervisor
Mijn leidinggevende is bezorgd om het welzijn van zijn/haar ondergeschikten
Mijn leidinggevende heeft aandacht voor wat ik zeg
Mijn leidinggevende helpt me om mijn werk gedaan te krijgen
Mijn leidinggevende slaagt erin mensen te laten samenwerken
Ik voel mij door mijn leidinggevende gewaardeerd

Social Support from co-workers
Mijn collega's zijn goed in hun werk
Mijn collega's zijn in mij persoonlijk geïnteresseerd
Mijn collega's zijn vriendelijk
Mijn collega's helpen me om mijn werk gedaan te krijgen
Als ik op mijn werk problemen heb kan ik de hulp van anderen vragen
Ik voel mij door mijn collega's gewaardeerd in mijn werk

Job Satisfaction
Ik ben tevreden met mijn baan
Ik zou mijn vriend(inn)en aanraden deze baan te nemen
Als ik voor de keuze stond, zou ik deze baan weer nemen
Deze baan beantwoordt aan wat ik zocht toen ik solliciteerde
Ik moet vaak werk doen dat ik liever niet zou doen
Ik zou mijn baan wel willen ruilen voor een andere

Organizational Risk Factors

2-puntsschaal: 0=Nee of Niet van toepassing; 1=Ja

Staffing resources
Is het in de afgelopen maanden voorgekomen dat door een tekort aan personeel een tekort aan personeel er niet volgens de regels of voorschriften gewerkt kon worden?
Heeft u in de afgelopen maand een regel of voorschrift niet gevolgd door een tekort aan tijd?
Wordt binnen uw locatie onevenredig veel verantwoordelijkheid op de schouders van full-timers gelegd? (in vergelijking met part-timers)
Is het voorgekomen dat bij verlof of ziekte niet voldoende personeel overbleef om het werk naar behoren uit te voeren?

Is het in de afgelopen maanden voorgekomen dat minder ervaren mederwerkers geen of onvoldoende begeleiding kregen bij het opdoen van praktijkervaring?
Is het voorgekomen dat bij verlof of ziekte geen of niet voldoende vervangend personeel werd ingezet?
Zijn er voldoende mensen binnen uw straat of activiteitencentrum om het werk naar behoren te kunnen uitvoeren?
Is het voorgekomen dat nieuwe medewerkers al in hun inwerkperiode volledig werden ingezet?
Zijn er in de afgelopen maanden wel eens problemen blijven liggen doordat het werkoverleg niet vaak genoeg plaatsvond?
Is het in de afgelopen maanden voorgekomen dat de werkzaamheden onvoldoende gecoördineerd werden?
Is het in de afgelopen maand voorgekomen dat "de leuke dingen voor de cliënten" niet gedaan konden worden?
Is het voorgekomen dat een wijziging in uw rooster u pas enige dagen tevoren werd meegedeeld?
Is het in de afgelopen maand voorgekomen dat uw werk u niet toeliet om te pauzeren?
Heeft u in de afgelopen maand delen van de zorgtaak wel eens overgeslagen of afgeraffeld om op schema te blijven?
Is het in het afgelopen half jaar voorgekomen dat een vacature op uw afdeling niet direct werd ingevuld door een inval-, oproep-, of vaste kracht?
Is in de afgelopen maanden uw rooster meer dan eens gewijzigd?
Is het in de afgelopen maand voorgekomen dat er geen of te weinig tijd was voor de schriftelijke en/of mondelinge overdracht?
Is het in de afgelopen maand voorgekomen dat een collega werk heeft laten liggen omdat hij/zij zelf niet meer aan toe kwam?
Heeft u in de afgelopen maanden wel eens overgewerkt, omdat een collega of leidinggevende daar op aandrong?
Is het in de afgelopen maand voorgekomen dat u, in het belang van de zorg, voor bepaalde taken meer tijd heeft genomen dan was gepland?
Is het in de afgelopen maanden voorgekomen dat het begeleiden of inwerken van nieuwe krachten in het gedrang kwam door andere werkzaamheden?
Is het voorgekomen dat u bepaalde werkzaamheden niet naar behoren heeft kunnen uitvoeren als gevolg van gemaakte bezuinigingen?

Communication

Is het voorgekomen dat u geen of te laat antwoord kreeg op een door u ingediend (schriftelijk) verzoek?
Heeft u in de afgelopen maanden wel eens te laat informatie ontvangen?
Is het voorgekomen dat u het centraal bureau herhaaldelijk moest benaderen voordat u de juiste informatie kreeg?
Is het voorgekomen dat het management afspraken met u niet is nagekomen?
Is het in de afgelopen maanden voorgekomen dat u iemand op het centraal bureau niet of moeilijk kon bereiken
Is het in de afgelopen maanden voorgekomen dat u informatie voor een vergadering of overleg niet of te laat ontving?
Heeft u in de afgelopen maanden wel eens moeite moeten doen om aan informatie te komen?

Is het in de afgelopen maanden voorgekomen dat u een maatregel niet tijdig kon nemen omdat de toestemming op zich liet wachten?
Is het voorgekomen dat informatie die u kreeg voor u niet duidelijk was?
Is het in de afgelopen maand voorgekomen dat de informatie in de dienstoverdracht voor u onvoldoende of onduidelijk was?
Is het in de afgelopen maanden voorgekomen dat u onvoldoende was geïnformeerd over de begeleiding van een cliënt?
Is het in de afgelopen maanden voorgekomen dat afspraken die gemaakt zijn tijdens het werkoverleg niet schriftelijk werden vastgelegd?

Job Skills
Zijn er onderdelen van uw werk waar u niet of niet voldoende voor bent opgeleid?
Is het voorgekomen dat u onvoldoende vaardigheden had voor het opstellen of bijhouden van een zorgplan/bewonersdossier?
Is het voorgekomen dat u onvoldoende vaardigheden had voor het uitvoeren van een zorgplan/ bewonersdossier?
Is het in de afgelopen maanden voorgekomen dat u niet wist hoe u met psychosociale problemen van cliënten om moest gaan? (bijv. gedragsproblemen)
Is het in de afgelopen maanden voorgekomen dat u informatie wilde, maar niet bij wie of waar u daarvoor moest zijn?

Training Opportunities
Zijn er voor u voldoende mogelijkheden voor (bij)scholing en/of educatief verlof?
Wordt u door het management gestimuleerd om voor het werk relevante bij- of nascholing te volgen?
Wordt u door het management in de gelegenheid gesteld om bij- of nascholing te volgen die carrière mogelijkheden vergroten?
Heeft u in het afgelopen jaar informatie ontvangen over cursussen die u voor uw werk kunt volgen?
Hebben de cursussen die u gevolgd heeft u kennis en/of vaardigheden bijgebracht, die u in uw dagelijks werk kunt gebruiken?
Is uw mening gevraagd over de kwaliteit van de cursussen die u gevolgd heeft?
Wordt u door <naam instelling> op de hoogte gehouden van recente ontwikkelingen in het vak? (denk aan voorlichtingsmateriaal, vakliteratuur etc.)
Is het cursusaanbod afgestemd op de specifieke problemen in de zorgsector? (denk aan psychosociale vaardigheden, gedragproblemen cliënten etc.)

Material Resources
Is het voorgekomen dat noodzakelijk materiaal niet werd aangeschaft?
Is het voorgekomen dat gepland onderhoudswerk niet werd uitgevoerd?
Is het in de afgelopen maanden voorgekomen dat u met materiaal van mindere kwaliteit heeft moeten werken? (bijv. artikelen voor de verzorging van cliënten)
Is het voorgekomen dat versleten of defect materiaal niet tijdig werd vervangen?
Is het in de afgelopen maanden voorgekomen dat u lichamelijk onnodig werd belast omdat er op uw afdeling te weinig hulpmiddelen aanwezig waren?
Komt het wel eens voor dat u door gebrek aan voorzieningen een cliënt in een voor u ongemakkelijke houding moet verzorgen?

Higher order goal facilitation

In welke mate kunt u de volgende zaken door uw werk bereiken:
5-puntsschaal: 1= in zeer beperkte mate; 5= in zeer grote mate
Gezond zijn of blijven
Me gewaardeerd voelen door anderen
Veilig zijn
Zelfvertrouwen hebben of houden
Mijn zelfrespect bewaren
Ontspanning ervaren
Me competent voelen
Geen lichamelijk ongemak of pijn hebben
Niet aan mezelf twijfelen
Niet middelmatig zijn
Niet ziek zijn
Niet door anderen afgewezen worden
Niet egoïstisch zijn
Niet slechter zijn dan anderen
Dat ik anderen niet schaad
Dat anderen mij niet links laten liggen
Dat ik geen overtredingen bega
Geen nare dingen ervaren
Dt ik me niet waardeloos voel
Dat ik anderen niet verkeerd behandel

SUMMARY

Quality of Work and Well-being of Health Care Employees:
Towards a problem solving intervention approach

High absence levels in the health care sector show that more attention for health and well-being of care employees is needed. To illustrate, in the Netherlands the percentage of absenteeism in health care settings in the last decade has consistently been above the national average. The data from Statistics Netherlands shows that between 1998 and 2010 absenteeism rates in health care were 1 to 3% higher compared to the national mean. Health care employees also experience lower job satisfaction and lower levels of job-related well-being compared to other occupational groups. In order to improve the quality of work of care employees, management of health care organizations need to carry out an active human resource policy. Active involvement of the employees in interventions focused on quality of work is of major importance in this context. Although associations between aspects of quality of work as job demands, job control, and social support on the one hand, and health and well-being of employees on the other hand have been established, at this point in time there is insufficient insight into the effective aspects of intervention programs, and into the mechanisms through which they resort their effects. Particularly in health care centers for disabled people, job demands for both care employees and their managers are high and the educational levels are in various instances too low. The importance of worksite interventions to improve quality of work and well-being of these care employees is obvious. However, a clear implementation approach as well as a proper rationale for the interventions is often lacking.

The aim of this thesis was to gain insight into the effects of a worksite intervention program for health care employees, to improve their quality of work and well-being. A problem solving approach was applied to implement the program. This thesis starts with a systematic review on the effectiveness of worksite intervention programs in improving quality of work and well-being of health care employees (chapter 2). In the next chapter a theoretical background on quality of work and well-being of employees is outlined (chapter 3). Next, a screening involving 1,673 employees from three experimental and three control health care centers for mentally disabled people is described (chapter 4) and the effectiveness of a problem solving intervention program directed at quality of work and well-being is evaluated (chapter 5). In a final study we studied whether changes in work conditions and higher order goal facilitation predict

the well-being of health care employees (chapter 6), followed by a general discussion (chapter 7).

In chapter 2, an overview is given of the developments of intervention programs in health care settings and their effectiveness in improving quality of work and well-being of health care employees. Multi-level programs, which include interventions that address the employees, the organization, as well as the work environment, are applied more often nowadays. These programs often use a combination of a top down and bottom up approach, where both the management and the employees participate in decision-making and problem solving processes. Research on the improvement of work conditions show that previous studies more often focus on changes in the content of work, than on the process. The findings of the twenty-one intervention studies included in the review indicate that the work conditions 'job demands' and 'social support' were most often favorably affected by the interventions. Furthermore, interventions seem to improve job satisfaction most strongly when a combination of a top down and bottom up implementation approach was used. Drawing firm conclusions on the common characteristics of successful intervention programs is hindered by the absence of a comprehensible framework regarding the implementation process. A problem solving perspective, which shares similarities with the participatory approach, emphasizes the goal directed, problem solving, pro-active and monitoring role of employees and could direct the implementation of future interventions.

In chapter 3 three theoretical perspectives on quality of work and well-being of employees are described. The Job Demand-Control-Support (JDCS) model is the most commonly applied model in research on occupational stress. In reviews on this model support has been found for the relation between job demands, job control and support from supervisors and colleagues on the one hand and well-being outcomes like depression, anxiety, job satisfaction and burnout on the other hand. Next to the JDCS model dimensions, organisational characteristics also seem to play a role in the well-being of health care employees. In previous research a number of organizational characteristics of the Tripod accident causation model, such as communication and training, explained additional variance in well-being outcomes. Therefore, this model is described in detail, and five organizational risk factors from the Tripod model are added to the screening and evaluation study (chapter 4 and 5). Additionally, a third theoretical framework, the problem solving approach, is presented in this chapter. This approach could guide the implementation process of worksite programs directed at improving quality of work and well-being of health care employees. The goal directed and monitoring characteristics of a problem solving approach, that incorporates a participatory approach including management as well as health care employees, makes it a fitting framework for the implementation process.

In chapter 4 the results of the screening that was conducted among 1,673 health care employees from three experimental health care centers (W1, W2 and W3) and three control health care centers (C1, C2 and C3) are presented. By means of a self-report questionnaire, employees evaluated their work and work environment. Next, each center was compared to the other five centers, which served as a reference group. The analyses showed significant differences between the six health care centers. On this basis, problematic work conditions and organizational risk factors were selected as intervention targets. Based on this screening, the management of the three experimental health care centers received advice on which problematic work conditions and organizational risk factors to target and how intervention goals could be set for a long term intervention program. Furthermore, several short term process related agreements were reached and support groups were appointed to monitor the intervention process. As the three experimental centers aimed for an improvement in quality of work and well-being of employees the following concrete goals were formulated for the intervention program: to develop a clear organizational structures, improve working procedures, improve communication and enhance training facilities for the employees. The three control centers were only informed about the results of the screening, without further advice or implementation of an intervention program.

In chapter 5 the results of an evaluation study of the intervention program to improve the quality of work and well-being of health care employees are presented. For the implementation of the intervention program, that was called Work Without Worry, a problem solving approach was applied. In this way, we were able to monitor pre-determined goals and study whether the implementation of a problem solving intervention program has (a positive) influence on quality of work and well-being of the health care employees. We evaluated this intervention program in a group of 461 employees, while 246 employees were appointed to the control group. Twice, with an interval of three years, information was gathered on work conditions, organisational risk factors and well-being outcomes of the health care employees. Analyses showed that participation in the Work Without Worry program had favourable effects on control opportunities of the health care employees, such as decision authority and skill discretion. Moreover, the intervention had positive effects on their job security and training opportunities. However, we found a negative effect on communication, which could be explained by the fact that the intervention program was initially more focused on the improvement of work procedures and communication skills were only addressed in a later stage of the intervention process. Furthermore, the results showed that after the intervention the well-being of the employees from the experimental group did not differ significantly from well-being in the control group. This result might be attributed to the negative effect found on communication, which may have

caused an insufficient improvement in job satisfaction. One can conclude that the problem solving intervention, as applied in the Work Without Worry program, shows important improvements in work conditions of health care employees. However, it is useful to study and compare different intervention approaches in the future, next to a control group.

In chapter 6 a longitudinal study is described that focused on the associations between changes in work conditions, changes in facilitation of employees' higher order goals and well-being outcomes. As described in chapter 5, 707 health care employees completed a survey on quality of work and their well-being twice, with a three-year interval. Hierarchical regression analyses showed that increased skill discretion and social support from supervisor, next to decreased time and work pressure and role ambiguity, are important predictors for the facilitation of higher order goals of health care employees. Furthermore, favorable changes in work conditions and higher order goal facilitation predicted well-being outcomes among health care employees, especially job satisfaction and emotional exhaustion. These findings suggest that changes in work conditions and facilitation of higher order goals are determining factors for health care employees' well-being. Therefore, in future research and practice, facilitation of higher order goals of health care employees deserves more attention.

In chapter 7, all findings from this thesis are discussed in view of the theoretical perspectives on quality of work and a problem solving approach. In addition, strengths, limitations and implications for future research are described. For the content of the intervention program theoretical models on job conditions (JDCS model) and organizational risk factors (Tripod model) were introduced and applied in the review chapter as well as the three empirical chapters. Additionally, the problem solving perspective was used in the worksite program as a framework to guide the implementation process. These three theoretical perspectives had already proven to be of importance in explaining and improving well-being of health care employees. However, so far these three perspectives had not been integrated in a worksite program to improve quality of work and well-being of health care employees. The findings in this thesis support the usefulness of this integrative, theory based approach. We found that several work conditions and organizational risk factors improved after an intervention program based on a problem solving approach. Furthermore, facilitation of higher order goals of health care employees has proven to be a new important element in this context.

SAMENVATTING

Kwaliteit van arbeid en welzijn van gezondheidzorg medewerkers:
Naar een probleem oplossende interventie

Hoge verzuimpercentages in de Nederlandse gezondheidssector tonen aan dat meer aandacht nodig is voor de gezondheid van welzijn van zorgmedewerkers. Uit cijfers van het CBS blijkt dat het ziekteverzuim van medewerkers in de gezondheidszorg de laatste 10 jaar 1 tot 3% boven het nationaal gemiddelde ligt. Gezondheidszorg medewerkers zijn ook minder tevreden over hun werk en ervaren minder welzijn op het werk dan medewerkers in andere beroepsgroepen. Om de kwaliteit van arbeid van medewerkers te verbeteren moeten managers van gezondheidszorg instellingen een actief human resource beleid voeren. Het betrekken van medewerkers bij interventies, die gericht zijn op kwaliteit van arbeid is in dit verband erg belangrijk. Hoewel er een samenhang is aangetoond tussen aspecten van kwaliteit van werk als taakeisen, controlemogelijkheden en sociale steun enerzijds en gezondheidsklachten van medewerkers anderzijds, is er onvoldoende zicht op wat werkt in interventie programma's, noch hoe en waarom ze werken. Met name in gezondheidszorginstellingen voor gehandicapten zijn de taakeisen voor zowel de medewerkers als de managers hoog en het opleidingsniveau van de medewerkers soms te laag. Het belang van interventie programma's voor het verbeteren van de kwaliteit van arbeid van deze zorgmedewerkers en hun welzijn is daarom duidelijk, maar het ontbreekt vaak aan een doelgerichte aanpak en een goede rationale voor interventies.

Het doel van dit promotieonderzoek was beter inzicht te krijgen in de effecten van een interventie programma voor gezondheidszorg medewerkers in termen van kwaliteit van arbeid en welzijn. Hierbij is een probleem oplossende benadering toegepast. In dit proefschrift wordt eerst een systematisch literatuur onderzoek naar de effectiviteit van interventie programma's om de kwaliteit van arbeid en welzijn van zorgmedewerkers te verbeteren gepresenteerd (hoofdstuk 2). Daarna wordt een theoretische achtergrond geschetst i.v.m. kwaliteit van arbeid en welzijn van medewerkers (hoofdstuk 3). Vervolgens beschrijven wij een screeningsonderzoek bij 1673 medewerkers van drie experimentele en drie controle instellingen in de gehandicaptenzorg (hoofdstuk 4) en wordt de effectiviteit van een probleem oplossings gericht interventie programma geëvalueerd (hoofdstuk 5). In een laatste studie onderzoeken wij of veranderingen in werkcondities en faciliteren van hogere doelen het welzijn van zorgmedewerkers voorspellen (hoofdstuk 6), waarna wij de resultaten uit de vorige hoofdstukken bediscussiëren (hoofdstuk 7).

Hoofdstuk 2 geeft allereerst een overzicht van de ontwikkelingen van interventie programma's in de gezondheidszorg en hun effectiviteit in het verbeteren van de kwaliteit van arbeid en welzijn van zorgmedewerkers. Multilevel programma's worden steeds vaker toegepast en omvatten interventies, die problemen van de medewerker, de organisatie en de werkplek aanpakken. Bovendien passen deze programma's een combinatie van een top down en bottom up aanpak toe, waarbij zowel het management als de medewerkers participeren in beslissings- en samenwerkingsprocessen. Onderzoek naar het verbeteren van werkcondities wijst uit dat eerdere studies zich vaker richten op het veranderen van de inhoud van het werk dan op het proces. Uit de review van 21 interventie studies blijkt dat de interventies vooral effect hebben op werkeisen en de sociale steun van gezondheidszorg medewerkers. Interventies lijken tevredenheid op het werk vooral te verbeteren als een top down en bottom up aanpak gecombineerd worden gedurende de implementatiefase van het interventie programma. Eenduidige conclusies over gemeenschappelijke kenmerken van succesvolle interventieprogramma's worden belemmerd door de afwezigheid van een referentiekader over dit implementatieproces. Een probleem oplossende interventie stijl die overeenkomsten vertoont met een participatieve aanpak, legt de nadruk op de doelgerichte, probleem oplossende, pro-actieve en monitorende rol van medewerkers en zou het implementatieproces van toekomstige interventie programma's kunnen sturen.

In hoofdstuk 3 worden drie theoretische perspectieven op kwaliteit van werk van medewerkers en hun welzijn beschreven. Het Job Demand-Control-Support (JDCS) model is het meest gebruikte model. In literatuur studies naar dit model is steun gevonden voor de relatie tussen werkeisen, controle op het werk en sociale steun van managers en collega's enerzijds en welzijnsaspecten zoals depressie, angst, werk tevredenheid en burnout anderzijds. Naast het JDCS model spelen ook organisatorische kenmerken een rol in het welzijn van medewerkers in de gezondheidszorg. Een aantal kenmerken van het Tripod accident causation model, zoals communicatie en training bleek in eerder onderzoek bij te dragen aan welzijnsaspecten van gezondheidszorg medewerkers. Daarom wordt ook dit model uitgebreid beschreven en worden vijf organisatorische kenmerken van dit Tripod model aan het screenings- en evaluatie onderzoek toegevoegd (hoofdstuk 4 en 5). Daarnaast wordt in dit hoofdstuk ook een derde theoretisch raamwerk besproken, namelijk een probleem oplossende interventie methodiek. Deze benadering zou richting kunnen geven aan het implementatieproces van interventieprogramma's op de werkvloer om de kwaliteit van werk van gezondheidszorg medewerkers en hun welzijn te verbeteren. De doelgerichte en monitorende kenmerken van een probleem oplossende interventie strategie, die samengaat met een participatieve aanpak van zowel het management als van de zorgmedewerkers, lijken een passend raamwerk voor het implementatieproces.

Hoofdstuk 4 laat de resultaten van een screeningsonderzoek zien, dat is uitgevoerd bij 1673 gezondheidszorg medewerkers van drie experimentele gezondheidszorg centra (W1, W2 en W3) en drie controle gezondheidszorg centra (C1, C2 en C3) in de gehandicaptenzorg. Door middel van een vragenlijst werd de medewerkers gevraagd hun werk en werksituatie te evalueren. Daarna werd elke gezondheidszorg instelling vergeleken met de andere vijf instellingen, die dienden als referentiegroep. Uit de analyses bleek dat er duidelijke verschillen waren tussen de zes gezondheidszorgcentra. Aan de hand hiervan werden problematische werk condities en organisatorische risico factoren geselecteerd als interventie doelen. Op basis van de screening kreeg de directie van de drie experimentele gezondheidscentra advies welke problematische werkfactoren aangepakt zouden kunnen worden en hoe interventiedoelen konden worden opgesteld voor een lange termijn interventie programma. Verder werden procesafspraken gemaakt voor de korte termijn en support groepen aangewezen om het implementatieproces te monitoren. Aangezien de drie experimentele gezondheidszorg instellingen als doel hadden om een verbetering aan te brengen in de kwaliteit van het werk en het welzijn van de gezondheidszorg medewerkers werden in de interventie programma's de volgende concrete doelen gesteld: het ontwikkelen van een transparantere organisatie structuur, duidelijkere werkprocedures, betere communicatie structuren en meer trainingsmogelijkheden voor de medewerkers in de instellingen. De drie controle instellingen werden na de screening alleen geïnformeerd over de resultaten, zonder verder advies of implementatie van een interventie programma.

In hoofdstuk 5 worden de resultaten gepresenteerd van een evaluatie onderzoek om de kwaliteit van werk van gezondheidzorg medewerkers en hun welzijn te verbeteren. Voor het implementatieproces van het interventie programma dat Zorgen Zonder Zorgen werd genoemd, hanteerden wij een probleem oplossende benadering. Zodoende konden we de vooraf gestelde doelen monitoren en onderzoeken of en in hoeverre het toepassen van een probleem oplossend interventie programma (een positieve) invloed heeft op de kwaliteit van het werk van de zorg medewerkers en hun welzijn. Dit Zorgen Zonder Zorgen programma hebben we vervolgens geëvalueerd bij een groep van 461 medewerkers, terwijl 246 medewerkers de controlegroep vormden. Tweemaal, met een interval van 3 jaar, werd informatie verzameld over de werkcondities, organisatorische risicofactoren en welzijnsaspecten van de gezondheidszorg medewerkers. Analyses lieten zien dat deelname aan het Zorgen zonder Zorgen programma gunstige effecten had op de controlemogelijkheden van gezondheidszorgmedewerkers, zoals hun ontwikkelings- en beslissingsmogelijkheden. Bovendien liet de interventie positieve effecten zien op de toekomstzekerheid van de medewerkers en trainingsmogelijkheden. We vonden echter een negatief effect op communicatie, wat verklaard kan worden doordat de focus van het interventie

programma eerst meer lag bij het verbeteren van de werkprocedures en de communicatie vaardigheden pas in een later stadium van de interventie aan bod kwamen. Verder bleek uit de resultaten dat de welzijnsaspecten van de medewerkers uit de interventiegroep niet significant verschilden van de medewerkers uit de controle groep. Mogelijk kan dit resultaat worden toegeschreven aan het negatieve effect op communicatie waardoor de tevredenheid op het werk onvoldoende verbeterde. Concluderend kan worden gesteld dat een probleem oplossende interventie aanpak, zoals in het Zorgen Zonder Zorgen programma werd toegepast, belangrijke verbeteringen laat zien in de werkcondities van gezondheidszorg medewerkers. Het is echter zinvol om in toekomstig onderzoek verschillende benaderingen met elkaar te vergelijken, naast de controle groep.

Hoofdstuk 6 beschrijft de resultaten van een studie die werd uitgevoerd naar de relaties tussen veranderingen in werkcondities en het faciliteren van hogere doelen van gezondheidszorg medewerkers op welzijnsaspecten van die medewerkers. Zoals beschreven in hoofdstuk 5 vulden 707 gezondheidszorg medewerkers twee keer een vragenlijst over hun kwaliteit van werk en welzijn in, met een interval van drie jaar. Hiërarchische regressie analyses toonden aan dat meer leermogelijkheden en sociale steun van de supervisor, naast minder werkdruk en rolonduidelijkheid, belangrijke voorspellers zijn voor het faciliteren van hogere doelen van gezondheidszorg medewerkers. Verder blijkt dat gunstige veranderingen in werkcondities en het faciliteren van hogere doelen met name de werktevredenheid en emotionele uitputting van medewerkers voorspellen. Deze resultaten suggereren dat veranderingen in werkcondities en de facilitatie van hogere doelen van gezondheidsmedewerkers (in ieder geval ten dele) verantwoordelijk zijn voor hun welzijn. Daarom verdient in toekomstig onderzoek en in de praktijk de facilitatie van persoonlijke doelen van gezondheidszorg medewerkers bijzondere aandacht.

In hoofdstuk 7 zijn alle bevindingen uit dit proefschrift bediscussieerd vanuit de theoretische perspectieven over kwaliteit van arbeid en een probleem oplossende interventie benadering. Bovendien worden sterke punten, beperkingen en implicaties voor toekomstig onderzoek beschreven. Voor de inhoud van het interventie programma werden de theoretische modellen van werkcondities (JDCS) en organisatorische risicofactoren (Tripod) gebruikt en in zowel het review hoofdstuk, als in de drie empirische hoofdstukken, toegepast. Tevens werd de probleem oplossingsmethode gehanteerd als een referentiekader voor het implementatieproces van het interventie programma. Van deze drie theoretische perspectieven was al aangetoond dat zij van belang waren in de verklaring en verbetering van gezondheid van medewerkers in de gezondheidszorg. Echter, tot nu toe waren ze niet eerder gezamenlijk toegepast in een interventie programma voor medewerkers in de gezondheidszorg om hun kwaliteit van arbeid en gezondheid te verbeteren. De resultaten van dit proefschrift onderschrijven de bruikbaarheid van deze geïntegreerde en theoretische aanpak. We

vonden dat sommige werkcondities en organisatorische risicofactoren verbeterden na een programma met een probleem oplossende interventie. Bovendien is de facilitatie van hogere doelen van gezondheidszorg medewerkers op de werkvloer een nieuw belangrijk element gebleken.

CURRICULUM VITAE

Hennie Koelewijn was born in Bunschoten, The Netherlands, on February 16, 1955. After completing her secondary education, in 1971, she started a bachelor at the Laboratory school in Amersfoort. She graduated in 1974 as a medical analyst and started working at the laboratory of the hospital in Baarn. In the next twelve years she became a full time mother of three children. From 1986 until 1993, she studied Clinical and Health Psychology at Nijmegen University. After her graduation she started her own practice Psychologisch Coaching Consult (PCC), where she worked with individual clients and managers on management development programs. In 1998 she started the "Work Without Worries" project on quality of work and well-being of health care employees in six health care centers providing care for the mentally and physically disabled, which resulted in this thesis. Since 1999, she works as a director of PCC Health Promotion, a management development organization with four locations in the Netherlands.